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NEXT MONTH

The trailer is coming to the forest, bringing not only the roaming vacationist but also the sportsman. In the July issue, Leo A. Luttringer, Jr., chief educational officer of the Pennsylvania Board of Game Commissioners, looks at this situation and reviews some of the effects the trailer hunter and fisherman may have on forest and game management.

Trees of the future are always an interesting subject, but when the glasses are focused on China—the conservationist's unfailing example of the evils of deforestation—the subject becomes doubly interesting. Donald D. Stevenson visited China and saw for himself—saw trees in China's future, and tells about it in the July issue.

Ben East, a writer and observer of real merit, sees a gallant fish pass in the Michigan grayling. Once abundant, this "flower of fish" is on the threshold of extinction. Be sure and read this moving article of its passing—and of the fight to save it.

The 62nd Annual Meeting of The American Forestry Association will be reported in this issue. There will also be stories by John Woods, N. V. Felsonvanyi, E. M. Davis and G. H. Collingwood.

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Member A. B. C.

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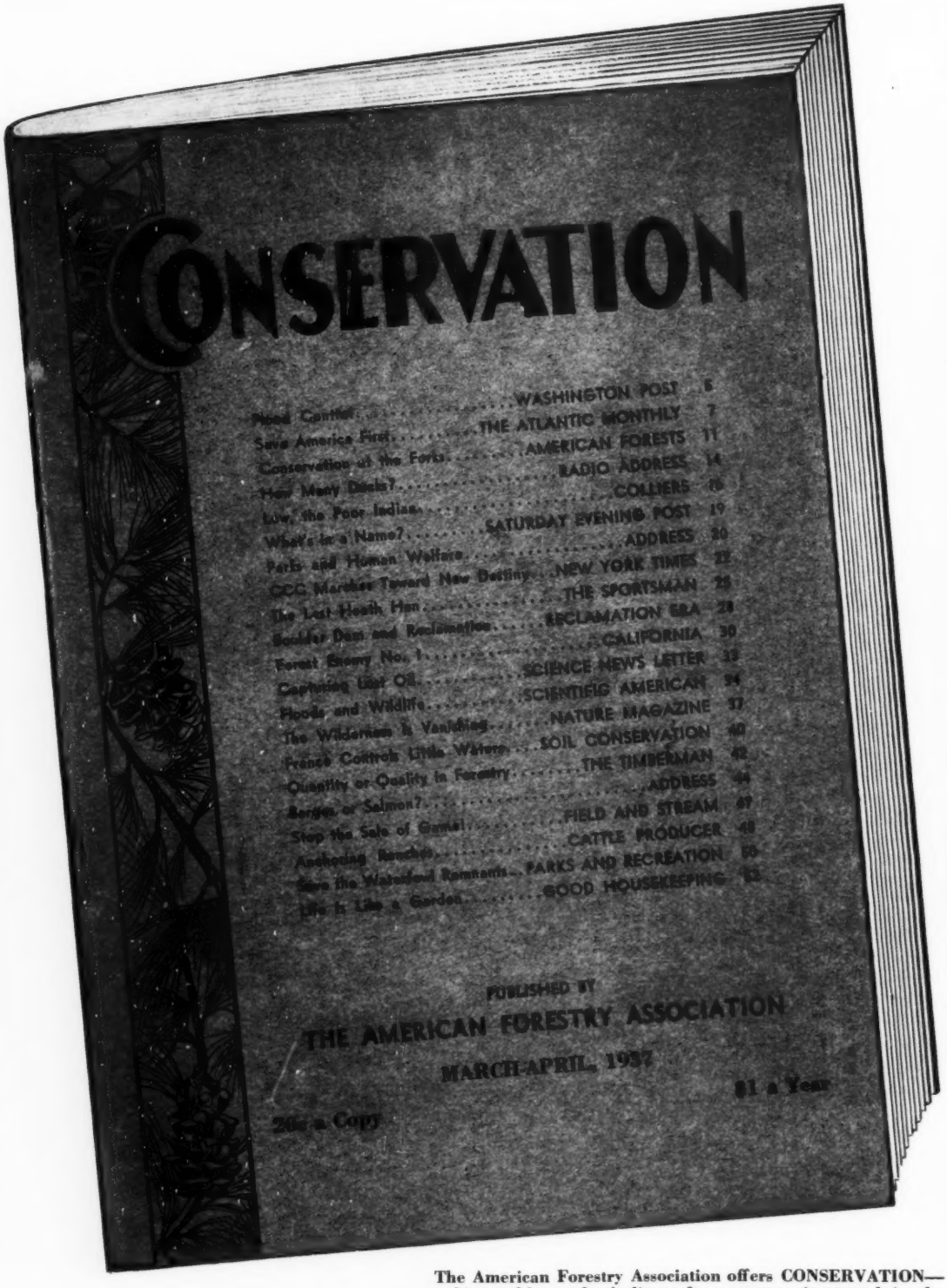
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FIRE!

■ Spring and summer usher in with unfailing reality one of the major conservation problems of the country —the prevention and control of forst fires. Each year fields and forests in every part of the country are ravished by fires that cause timber and property losses running into millions of dollars. Greater still are the intangible and indirect losses resulting from subsequent erosion and floods, dislocation of industry, summer recreation and local tax income, destruction of wildlife and natural beauty.

In spirit and substance, forest fires strike at the foundation of conservation and its every field—soil, water, wildlife, outdoor recreation, public and private forests and parks. Even human life must be included. Millions of dollars of public funds have been spent during recent years in conservation works. These investments no less than the resources they are designed to safeguard may be wiped out almost overnight by the 140,000 fires that annually spread flames and smoke from Florida to Alaska.

From the beginning of forest conservation in this country, The American Forestry Association has held fire prevention to be the backlog of conservation progress, and it has made it the major objective of its educational work. By every means at its disposal, it has sought to develop a public sentiment that will deal with fire in fields and forests as an epidemic of disease is dealt with by enlightened communities. It has sponsored and crusaded for fire prevention laws and for state and federal appropriations adequate to the task of dealing with the problem. Prevention and control of forest fires is imperative to public welfare and therefore is a joint responsibility of the land owner, the State and the Federal Government. There can be no lasting conservation, the Association holds, until the fire problem is solved; therefore elimination of forest fire is the ABC of conservation progress.

Note—In this space is presented each month the Association's policy with respect to timely phases of conservation.

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The Editor's Log

"THE MOST threatening attack upon the farmers and farm interests of America in many years has recently been launched."

Thus begins a letter mailed on April 20 from the Washington headquarters of The National Grange to its 8,000 Granges, representing 800,000 farmers throughout the country.

"Your help is needed," the letter continues. "The Brownlow Committee report on the Reorganization of the Federal Executive Departments, submitted by the President to Congress with his approval on January 12, 1937, recommends, in the respected name of conservation, whittling pieces off the Department of Agriculture, * * * in order to aggrandize another Department.

"This is a strong statement, but it is a true statement. The Brownlow plan proposes to change the name of the Department of the Interior to the Department of Conservation, and under that smoke screen transfer to the renamed department many of the duties that the Department of Agriculture has performed so well, leaving it in an unbalanced condition to carry on its extremely important services to the nation's agriculture.

"It calls to mind the custom of certain natives of South America, who, when they want a beefsteak, cut it out of a living cow and let the wounded animal stagger along until they want another steak. In the end, this cheerful custom kills the cow.

"This is not the first attempt to get steaks off the Agriculture cow. It will be recalled that when Albert Fall was Secretary of the Interior, he tried to get away with the Forest Service. Fortunately, the friends of the farmers and the forests were able to stop him.

"Adoption of the plan embodied in the Brownlow report would give us two Departments of Agriculture, one for private lands and research under the present Department of Agriculture, and another for public lands under the proposed Department of Conservation. It would create two Forest Services in two separate departments; two grazing services; two Biological Surveys; two Bureaus of Fisheries, and two Soil Conservation Services.

"Such a plan is worse than foolish. It would make a mongrel out of the proposed Department of Conservation, and would hamper and hamstring the work of the farmer and the government in most serious fashion.

"The farmers of America have always been opposed to any such plan, and they are opposed to it today. At the annual session of the National Grange held at Sacramento, California, in 1935, a report was unanimously adopted opposing such a move."

The letter concludes by calling attention to the fact that a Joint Congressional Committee on Governmental Reorganization is holding hearings on this proposal and by urging all members of the Grange to make their opposition known to their Senators and Congressmen.

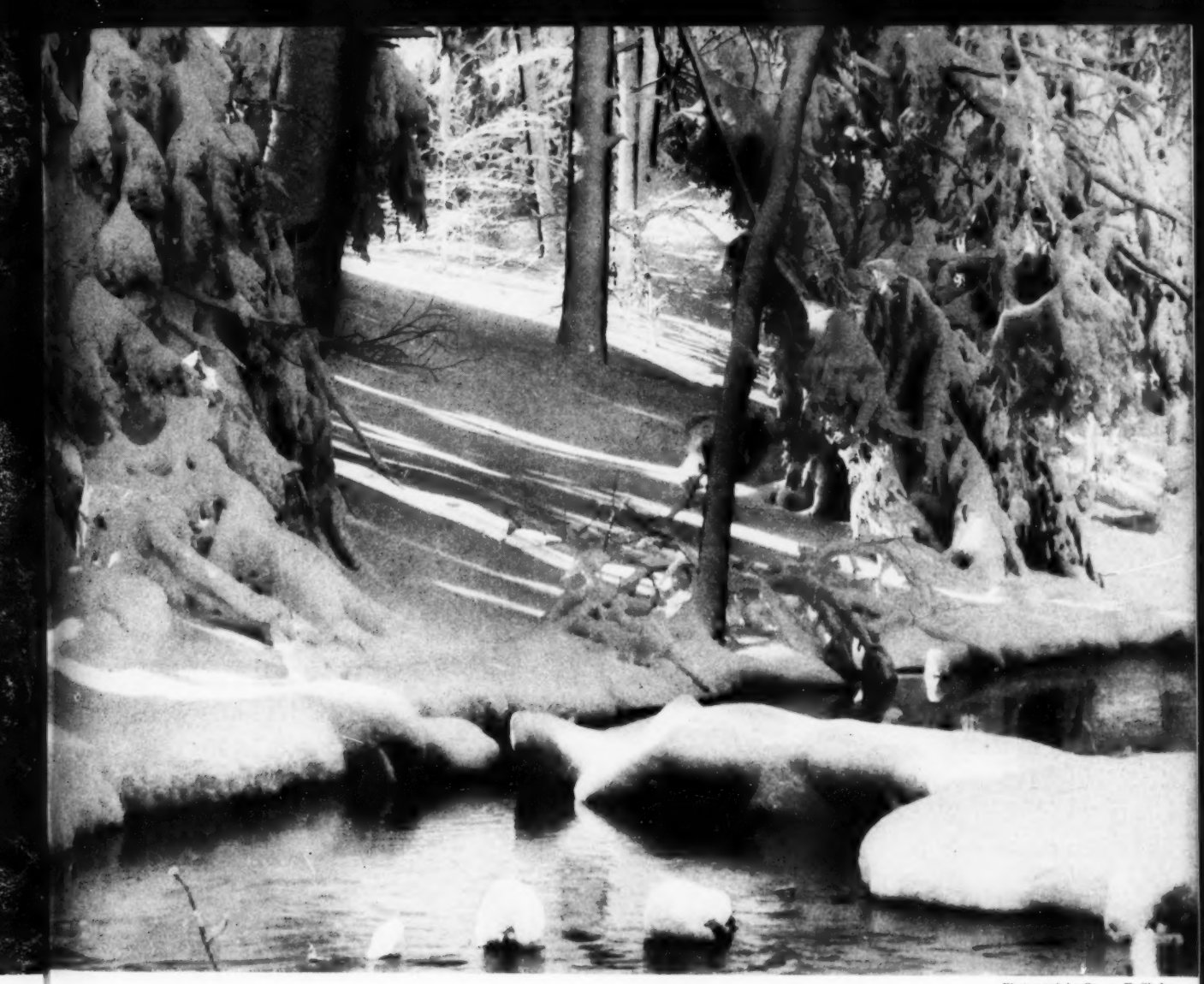
Grass-root farmers work without gloves. Blunt and direct though this letter is, it expresses in greater or lesser degree the view of more than forty-five other organizations that have gone on record against the proposal to cut forestry steaks from the Department of Agriculture to provide meat for a Department of Conservation. In a survey of the conservation fields, advocacy of the proposal, outside the shadows of the Department of the Interior, — chief beneficiary of the plan, — is conspicuous by its absence.

Ord Rutter

Editor.

HOW FORESTS

Above—In summer, the branches of the trees break the shock of the rainfall—Linville River, North Carolina. Right—In New Hampshire —the accumulated duff on the forest floor holds back and regulates the run-off



Photograph by George F. Slade

In winter, the forest serves as a raised blanket, catching much of the snow and letting it drip slowly to the ground as it melts to be absorbed by the soil or gently find its way to a stream. Newbury, New Hampshire

S RETARD FLOODS

By CHARLES F. BROOKS
and
HENRY I. BALDWIN

ENGINEERS, beaten by big waters in flood, have turned to the damming of the little waters, to prevent their reaching the big waters all at once. Foresters are working still farther upstream, in fact, covering the entire watershed so far as present needs of agriculture for cleared land permit. Nobody, in the face of the abundant evidence now available, can deny that forests are a great deterrent of floods.

Yet the reasons in any one case are not always apparent. Floods are caused by one combination of conditions in one instance and by a totally different set at another time and place. Much has been written about the regulating effect of the sponge-like humus of the forest floor. But what if this soil cover is saturated, frozen, buried under deep snow? Is the forest then of no avail? Or, what if the forest has been cut and replaced by brush and sprouts? Is such cover equally potent?

Some people will say yes, others no; they are thinking of different combinations of circumstances. Forests influence the way rain and snow are received and run off on the earth's surface quite differently at different seasons of the year, differently on steep mountains from on plains and with every new complex assortment of storms which Old Man Weather contrives.

Forests are the characteristic natural vegetation

of humid climates with abundant snow and rain, and it is precisely in these regions where floods have always occurred even when the forests were unbroken, and man had influenced the soil little if at all. No one will deny that man has profoundly altered natural conditions in a multitude of ways and also that floods are more destructive of life and property than at an earlier stage of settlement. Yet there is a distinction between floods and the destruction caused by them. Floods became destructive only when human life and property was placed in the path of the waters by man's encroachment on the ancient flood plains of the rivers, and when flood crests were raised and hastened by quick runoff on the denuded and often eroded hills of the watershed.

The first attempts at flood control were always remedial, rather than attacking the causes. Levees and dams are costly frontal attacks at an unfortunate point in the water cycle where the river is strong and man is weak. A more strategic point of attack is at a place and time when the rain drops come down and they have not yet gathered strength. It is here that forests have played their part and very effectively too.

Suppose ourselves in the position of Jupiter Pluvius and wishing to make the greatest flood possible within the limits of the climate of a region, what should we do? First, we should call on burly Boreas or his northwesterly brother, Skiron, to blast their polar continental air masses over the region, in order to freeze the soil deeply and to provide an obstruction for the elevation and chilling of humid winds next to come. Second, we should ask mild, south Notos to gather his tropical air masses for an attack on the weakening polar air masses of Boreas and Skiron. Notos would have to fetch them for a long way over warm tropical waters to energize the air masses adequately for the onslaught. Third, we should stage the battle. We should bank up the polar air masses to the west or north of any height of land; then lead the tropical air masses upward over the front. Now and then we should have the modified polar air masses turn the flanks of the tropical, thereby giving them an extra heave upward. Again and again in the course of a week or two we should bring in fresh reinforcements from a distance to take the places of the worn-out contestants.

In the first stage of the battle of the air masses the frozen ground would become deeply covered with snow; then rain would compress and fill this snow. In the second stage, more snow might be laid down, but with the tropical air masses then arriving in full force, heavy rains would fall and the warm winds would attack the saturated snow cover. Aided to a slight extent by the warmth of the rain and by the dim sunshine filtering through the dense clouds, the blasts from the tropics would drive bullets of warm air into the snow and discharge great quantities of latent heat onto the surface. The snow would melt like magic, the waters would begin to flow, and, as the snow cover disappeared, they would run off the frozen surface as from a roof. The little waters would gather rapidly into big ones, and a great flood would spread over the lowlands.

Driving on a treeless and grazed slope, the rainfall races madly off, cutting great gullies in the land. Carroll County, Mississippi

Instead of a pitched battle, we could stage an air-raid if it were late summer or early autumn. We could send a hurricane ashore and have it circulate over a mountain region for a day or two. If we first sent in a minor storm to scout and make preliminary preparations for a flood, the terrific rains of the hurricane would fall on saturated soil, which would be almost as good a runoff surface as frozen ground.

Of course, really to set the stage for a gigantic flood we should first cut and burn off all the vegetative cover from the hills, and give them time to become eroded and gullied into steeply and deeply

dissected valleys like the Bad Lands of South Dakota. Such a surface and such a topography would then produce the most rapid runoff and quickest flood rise. Runoff from eroded subsoil is many times as fast as from uneroded soil with its greater pore volume and capacity for absorbing some of the water.

As weak mortals, what could we do to mitigate the effects of the mass attacks or air raids of Jupiter Pluvius? Obviously, we could not prevent him from deluging us with snow and rain. Could we keep the snow from reaching the ground or from melting so fast; could we keep some of the rain off the ground; could we lay innumerable small dams to obstruct the runoff; could we keep channels into the ground open? Yes, we could, by maintaining or planting dense forests.

But adjacent to the scene opposite, where trees have been left, the forest has cushioned the rainfall and held the soil intact

To start with, we could hinder some of the precipitation from reaching the ground. Interception of snowfall by dense young spruce may be as much as 999 parts out of 1,000, leaving only one to reach the ground. This intercepted snowfall later blows away and is largely intercepted again or it evaporates or it melts and drips to the ground. All forests are not of young spruce, so the amount of interception is extremely variable, though always more in coniferous forests than in hardwoods, often four to five times as much. In ponderosa pine forests in Idaho, up to the time of maximum snow depth, twenty-seven per cent of the total snowfall had been intercepted by virgin forests, twenty-two per cent by mature stands, and eight per cent by young open stands.

A good illustration of the way snow is intercepted by trees was the snowstorm of March 20, 1937, in southern New Hampshire, when fourteen inches of wet heavy snow fell at Hillsboro. On March 24, long after all snow had evaporated from the trees, the following readings were made at the Fox Research Forest on permanent snow stakes carefully set on level ground before the ground froze. Stakes were set in pairs, one under the forest canopy as far as possible from tree trunks, and one nearby in an opening for comparison.

TYPE	Depth of snow (inches) In forest	In opening nearby
Exposed open hilltop	....	8
Twenty - thirty year old paper birch	9	10
Thirty-forty year old white pine	7	13
Fifty-sixty year old white pine	5	13

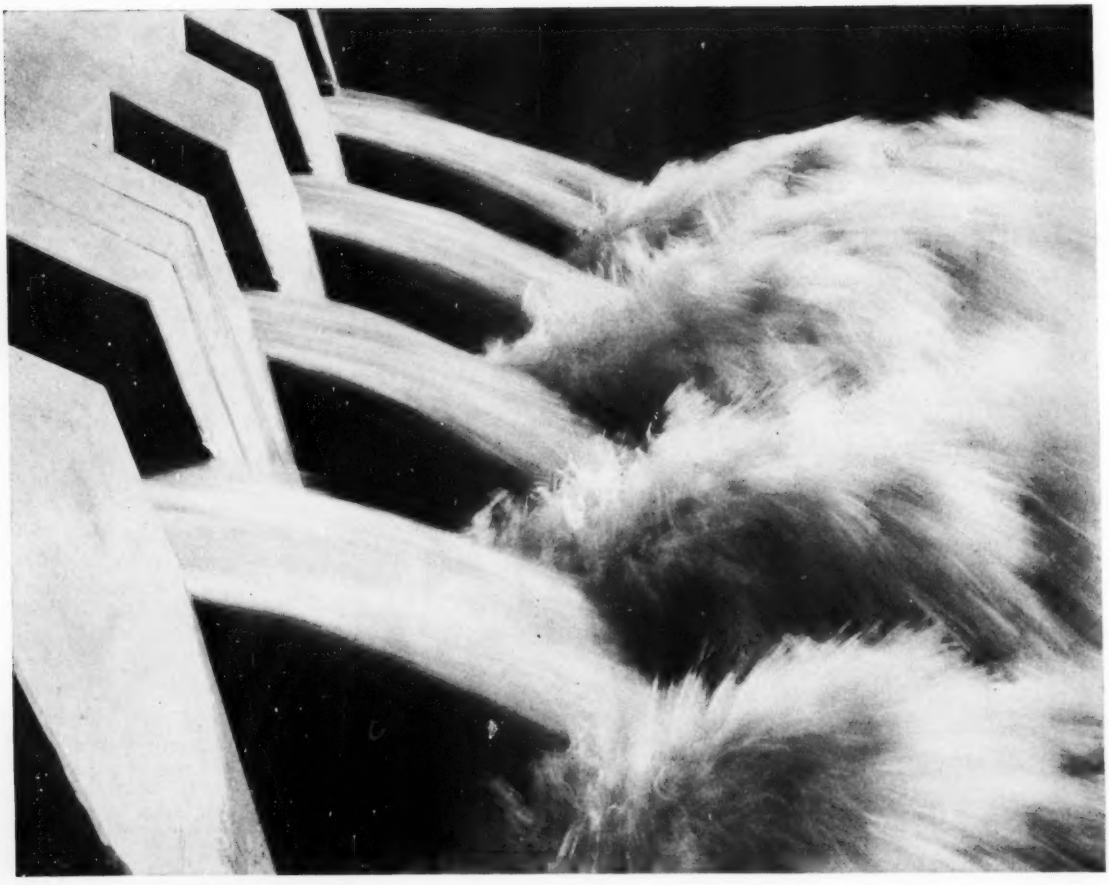
Further, rain is partly retained by trees and later evaporated from the leaves and branches. Light showers may be completely intercepted in this way. Rain sometimes freezes on trunks and evaporates. The taller the trees and the more the forest is filled with trees of various ages and heights, the thicker the maze through which raindrops must spatter. This is important, since it is sometimes claimed that low brush or sprout cover is as effective as high forests in reducing floods. Broad - leaved trees are more efficient natural umbrellas than evergreens when they are in leaf, but frequently floods occur when they are bare of foliage. Measurements show that one-sixth to one-third of the total rainfall may fail to reach the ground. What does not reach the ground cannot run off and add to flood waters, and when one-quarter of the rainfall is withheld—or even delayed—it may make the difference between a usual spring freshet and a disaster.

During prolonged downpours the proportion intercepted is diminished, but the time during which rain reaches the ground is prolonged and it strikes less violently. Extending the time over which rain reaches the ground means that less water reaches the ground each minute than if no trees interposed and thus, less is available to swell the flood. Beating raindrops quite often start soil-washing and erosion.

Water sinks easily into forest soils. Recent experiments in Switzerland showed that it took the same rainfall five times (*Continuing on page* 316)

CONTROLLING MAD WATERS

By CARLOS G. BATES



Steel gates in the Charles Mill Dam, Muskingum Conservancy, Ohio, letting angry waters pass into a stilling basin below

ANOTHER great flood on the Ohio River has come and gone, this time at least twenty per cent larger, at its crest, than anything which Army Engineers had previously considered as a probable contribution from the Ohio for which flood-control works on the Lower Mississippi should be designed. The lower portion of the Ohio Valley and some of eastern Arkansas received the greatest concentration of rainfall January 6th to 26th, but taking the month as a whole, the averages for Kentucky and Tennessee were highest, about fifteen inches over their entire area. These extraordinary quantities, in a region fully accustomed to heavy winter rains, account for the enormous runoff. Fortunately, the more distant drainage areas of the Upper Mississippi and Missouri, Arkansas and Red Rivers, and even eastern tributaries of the Ohio and Tennessee were not wetted excessively although the rainfall of the latter amounted to ten to twelve inches.

While menacing Cairo, the flood passed through the lower Mississippi channel with little difficulty. The channel improvements and outlets which have been constructed since 1927 were tested but never severely tried. The capacity of the storage basins above the new dams on the Tennessee River being utilized throughout the flood period, however, unquestionably had measurable effect in reducing the contribution to the crest of the Ohio.

It being admitted that the channel left to the Lower Mississippi, between levees, can carry scarcely more than half of the greatest flood which is now computable as a reasonable expectancy, there is obvious need to carry out the Jadwin plan for the lower river. This plan implied not so much the indefinite raising and thickening of the levees as the provision of additional flood channels, more or less parallel with

the regular river channel, whose use appears feasible and attainable without prohibitive cost *if* the speculative buzzards, now quarreling over the "spoils" of this development, can be disposed of. The southern communities having most at stake should, before another great flood in the Mississippi occurs, convince the Congress that they want flood protection more than they want Treasury pap.

To this master plan for the lower river, the Army Engineers, with fifty years of experience behind them, have applied themselves whole-heartedly, and no one would deny them credit for great thoroughness and engineering skill.

The further matter of flood-control reservoirs was approached by the Army Engineers, immediately after the 1927 flood, with great reluctance. As late as 1929 plans put forward by them, on the basis of a very hasty survey of storage reservoirs of the Ohio and Mississippi Valleys above Cairo, showed only a half-hearted interest in this subject and a rather evident disposition to discredit the effectiveness of reservoirs for flood storage and control. Calculations then made were based on the rather absurd assumption that these reservoirs would have to accumulate water over a ninety-day period, at each season when a flood *might* develop, instead of being held in readiness for filling when a flood was actually in the making. Naturally, such calculations showed that only a small effect on flood crests could be produced by reasonable storage developments.

The document of 1934, "Development of the Rivers of the United States," indicates that this skeptical attitude toward reservoirs has changed with the years. There have been recent assurances by the administration, too, that a fully effective plan for flood control is in readiness. Many persons expected that the report of the Water Resources Committee of the National Resources Committee, transmitted to Congress February 3, 1937, as "Public Works Planning,"—a "reservoir of projects" to be undertaken over a period of years,—would embody an actual plan of flood control; at the very least would represent some planning of the development, as well as the use, of our water resources, on which all too many demands are made. This "reservoir" lists many projects of a worth-while nature, including a number of the flood dams whose construction has been recommended by the Corps of Engineers, but the best that can be said of the report is that it includes nearly every job-making recommendation which has come from local groups, with a minimum of sifting and with little emphasis on the conservation of waters. The Water Resources Committee refuses to recognize that land-use and

The sea wall city of Cairo, where the mad waters of the Ohio and Mississippi met

cover conditions of watersheds bear any relation to water supplies.

It is not sufficient merely to carry the Mississippi waters safely away to the Gulf after they have been blended at Cairo. The valleys of several of the main tributaries, like the Ohio, must be protected as well, and there are thousands of smaller valleys annually ravished by freshets and floods which go unchecked. Yet no one should suppose that the building of large flood reservoirs offers a simple and easy solution of flood problems, or in any sense a complete solution for either the local or major Valley problem. It is neither wise to "laugh them out of court," nor to give reservoirs the sole seat of honor in court.

To illustrate, reservoir construction contemplated on the Ohio at an estimated cost of $210,000,000 provides storage for only about six per cent of the flood discharge occurring at Cairo January 1 to February 20, 1937, and can be effective only if used to "knock down" the crest as far as close timing will permit. The construction of reservoirs to the extent of a billion dollars would not prevent large floods in the Ohio or Mississippi Valley and would reduce by very little the damage done in smaller valleys.

Every promising and well-conceived means of flood control deserves public support and the cooperation of every citizen who can in any way assist the common undertaking. By applying some effort to small streams, and to the land throughout the drainages, we may hope eventually to reduce very greatly flood damage in this land of ours. But the almost unbroken and enormous agricultural expanse of the Mississippi Valley presents an especially serious and difficult problem of water concentration because it must remain the main agricultural support of the nation.

We have been told by engineers,—whose interest is largely, and quite naturally, in the construction of great, monumental "works,"—that control of the headwaters of streams cannot possibly have any significant effect upon floods in the lower valleys. No one with a grain of common sense is going to believe such a statement, no matter how the "calculations" may be manipulated to demonstrate it. The degree and time of such effect, of course, will depend upon where the "headwaters" are located, but in the proper use of this word it implies all upland portions of the drainage area, and some of these may be very close to the most critical section of the main stream channel.

To deny the effect on floods of holding back "headwaters" is to deny that the water which causes floods comes largely off the land, and to assume that it falls largely in the stream or in swampy areas adjacent thereto. It is equivalent to denying that reduction in the amount of a flood-producing rain, by any given percentage, would have an essentially proportionate effect upon the crest and total volume of a flood.

This engineering point-of-view arises largely from too great a concentration of thought upon one or two sections or points in a main channel. To illustrate, suppose that in the treatment of the Ohio problem it should be decided that Cairo must be protected from certain maximum flood stages, no matter what might happen to the remainder of the valley,—a plan which would also insure that the Ohio should discharge into the Lower Mississippi only a certain maximum crest flow. Then, obviously, an expenditure to control the Tennessee and Wabash Rivers would be more effective than any other, because such control would give a direct "leverage" upon the Ohio at the precise time when it was most needed.

But that is not, cannot be, the sole purpose of flood control, and the extension of the benefits of true "control" to thousands of small valleys will, without doubt, more than compensate for the added cost of such a comprehensive system in comparison with what may be described as a "focal point" system. Moreover, if control were concentrated on such a point as suggested above, a great flood would sooner or later occur in which the Tennessee or Wabash River played no part. It is, therefore, plainly a matter of wisdom not to "put all the eggs in one basket."

This does not suggest half of the complexities which arise when we contemplate an actual plan of flood control through reservoirs and upstream storage, as contrasted with flood disposal. Shall storage reservoirs be constructed for flood-control purposes solely, being emptied as soon as possible after each flood, so that their entire space will be available when a new emergency develops? Or shall manifold other uses, such as power development, be allowed and provided for in the plan? In a strict sense there can be no such dual use of reservoirs without greatly weakening, perhaps largely eliminating, the possibility of effective flood control. Without doubt there will have to be compromise under the American system, which always holds out the hope (for political purposes) that the body politic can both eat its cake and have it.

There are localities where the need for cheaper power is so great as perhaps to justify the compromise and combination of purposes, others in which flood-control dams may have to be superimposed on existing power dams if any flood control is to be had. Some conflict with public utilities seems inevitable and must be faced. In all cases, the impoundment of water is certain to mean some retirement of agriculture and perhaps of small villages and industries, from reservoir sites in the valleys. For strictly flood-control purposes, however, successive impoundments can generally be of short duration and need not mean complete abandonment of agricultural bottomlands.

Because flood control by means of reservoirs has these social and economic aspects, as well as continuous operation and integration of parts to consider, far beyond the mere aspects of engineering selection, design, and construction, the task

becomes one for special Water Authorities having continuing responsibility, very broad powers overlapping state lines, and broad social outlook for the welfare of all interests within their territories. Such authorities must be developed by drainage-basins, but it is obvious that the entire Mississippi drainage covers too extensive and diverse conditions to be intelligently handled by any single commission and must be broken up into several units. These will require coordination by a primary Mississippi Authority whose main problem will be to obtain from each tributary unit the greatest possible action toward reduction of Lower Mississippi floods.

Let no one suppose that ground-storage of water does not occur in a very large measure during all floods. Yet it can be greatly increased.

If a drop of water falling at any point on the Mississippi drainage area is likely to reach Cairo at the same time that other and excessive billions of drops from the north, east, and west arrive there, the storage of that drop of water is a matter of national concern.

Storage of water in the ground at the point where it strikes the ground is of exactly the same degree of importance, in large-scale flood prevention, as storage in a small reservoir within a short distance of that point. But storage in the ground may have the added advantage of entirely preventing soil erosion, of replenishing soil moisture for crops, and of eliminating all local damage. It is, therefore, worth much more than reservoir storage.

To obtain a mass effect upon floods by the building of tiny reservoirs upon almost every farm and field,—a plan recently connotated by the name "upstream engineering,"—is not impossible, but its cost would be prohibitive and it can be justified only in individual instances by some very tangible and substantial benefit to the farm itself, such as the checking of a gully which threatens the complete destruction of land.

(*Continuing on page* 300)

Power reservoirs, illustrated here on the New River, West Virginia, are of uncertain and often of no value in flood control because they must be kept filled or nearly so and their capacity to store excess water in flood times is therefore limited

The Charles Mill Dam and Reservoir in Ashland County, Ohio — one of fourteen "conservation pools" now in course of completion in the Muskingum Conservancy. They are for flood control exclusively and will be kept empty or nearly so in order to hold back and regulate runaway waters in flood time

IT CAN HAPPEN HERE

By GIFFORD PINCHOT

THERE are two great questions before the people of the United States today, and the one is no more important than the other. One of them has convulsed the country. The other has scarcely been heard of. One of them is the Supreme Court issue. The other is the proposed maladministration of the natural resources of the nation and wrecking of the conservation policy, under the plan for the reorganization of the Executive Departments now before Congress.

What Theodore Roosevelt understood by Conservation is the use of the earth and all that therein is for the permanent benefit of the people who live upon it. That was its definition when it began, and it is no less accurate today than it was then.

The purpose of Conservation was then and is today the greatest good to the greatest number for the longest time.

The Conservation policy includes not only forests, waters, lands, and minerals, the crops and the iron and coal which they produce, and the game and fish which they support. It includes also the conservation of human resources, and of other human interests. Conservation is the wise and far-sighted use of all the things—natural, artificial, and spiritual—which men require upon this earth.

If that is right, then Conservation is as wide as the earth itself, as inclusive as the needs and interests of humanity upon the earth. It is far too great a question, therefore, to be included within the narrow bounds of any single government department.

Conservation, to put it in another way, is the background, the spirit, and the strength of the progressive movement in American public life. It is the forward-looking point of view. It is the signboard on the road to a greater and better America.

A certain committee, known as the Brownlow Committee, has prepared a report on the reorganization of the Government, which contains many excellent recommendations, and some even worse than the others are good.

The Brownlow Report constitutes, in my opinion, the most dangerous attack that has been made upon the National Conservation policy since it was first laid before the people of the United States by Theodore Roosevelt, at the great Conference of Governors in 1908.

In 1905 the National Forests were transferred by Congress from the Interior Department, where they had been abominably mishandled, neglected, and abused, to the Agricultural Department, where their handling has been, and still is, a model and a mark to shoot at for all other departments. Ever since that time, at intervals, a Secretary of the Interior has tried to get them back. The most notorious attempt, and the attempt which most nearly succeeded, was made by the even more notorious Secretary Fall.

Secretary Fall's attack on Conservation was, however, limited to the Forest Service. That was bad enough in all conscience, for the Forest Service was the originator of the Conservation policy, and ever since has been the spearhead of the attack on the waste and destruction of our national natural resources. But the present attack goes far beyond that.

The present attack on Conservation is not only more threatening, but if it should succeed, it would be vastly more dangerous to the whole Conservation policy. It recommends that Secretary Fall's plan for the transfer of the National Forests back to the Interior Department shall be carried out. In addition it recommends that the Conservation work shall be dismembered and scattered between two Departments.

What the Brownlow Report proposes is to dislodge, dislocate, and break up certain most important parts of the government conservation work and divide them between the Department of Agriculture, where they now are and where they are now well handled, and the Department of the Interior (renamed as the Department of Conservation) whose handling of publicly owned natural resources is one of the blackest scandals of our history.

The Brownlow Committee suggests renaming and camouflaging the Department of the Interior under the name of the Department of Conservation, whose duty it shall be:

> "To advise the President with regard to the protection and use of the natural resources of the Nation and the Public Domain.
>
> "To administer the public lands, parks, territories, and reservations, and enforce the conservation laws with regard to public lands and mineral and water resources, except as otherwise assigned."

Please take notice: "to administer the public lands, parks, territories and reservations, and enforce the conservation laws with regard to public lands."

The duty of what is to remain of the Department of Agriculture would be:

> "To advise the President with regard to Agriculture.
>
> "To conduct research on agricultural problems; to continue and develop relations with State and local governments in agricultural research, agricultural education, and the conservation and development of private lands and other resources affecting the agricultural supplies of the Nation; and to enforce and administer laws dealing with agriculture."

Please note: "To conduct research . . . . and the conservation and development of private lands."

All this means, if the English language has any meaning, that, in the opinion of the Brownlow Committee, the forest on private land is one thing, and ought to be handled in one Department, while the precisely similar forest on public land is another thing, and ought to be handled in another Department.

If the language of the Committee means what it

says, a grouse, a deer, or a trout on private land is one thing, to be handled in one Department; and the same grouse, the same deer, and the same trout, if it should happen to move from private to public land, is a different thing, to be handled by a different Department. And so with questions of soil conservation, grazing, and water.

In other words, the Brownlow report proposes to divide up the natural resources with which the Federal Government deals, not on the basis of use and protection, which is the only sensible basis, but on artificial and constantly changing basis of ownership. It would be just as reasonable to propose that your real estate agent keep house for you.

I am more than ready to acquit the Brownlow Committee of any evil intention. I have no doubt that these recommendations were made in all sincerity, but this is not the first time honest men have gone haywire when dealing with questions outside their responsible experience.

To be specific, the Brownlow report means that the Biological Survey, the Soil Conservation Service, the Forest Service, the management of pasture and range, and all the rest of the innumerable questions which concern the soil and growth from the soil, shall be split up in accordance with an artificial distinction which has no existence in nature,—and all that under the sacred name of avoidance of duplication and putting similar subjects together.

The National Grange has recently sent out a letter protesting against this attack, which refers to the proposed crime against Conservation as follows: "It calls to mind the custom of certain natives of South America who, when they want a beeksteak, cut it out of a living cow and let the wounded animal stagger along until they want another steak. In the end, this cheerful custom kills the cow."

Previous attempts to cut steaks off the Agricultural cow, whether by Secretary Fall or anybody else, have not succeeded. Other attacks on the farmer who feeds us all, and on game and fish have failed. This senseless and useless effort to cripple and hamstring the Conservation policy, whose protection and advancement is our common purpose, must be defeated, as it deserves to be.

The proposal to transfer the National Forests to the Conservation Department and leave forest research in the Agricultural Department, is bad administration of the very worst kind. If anything is proved in Government work it is that to separate administration and research means bad administration every time. As good an illustration as I know is the General Land Office in the Department of the Interior. Research it had none, and its mishandling of the Public Lands became a scandal, the stench of which is with us yet.

What can be gained by transferring the Forest Service to the renamed Interior Department? What subdivision of the Interior Department is better run today than the Forest Service? Not a single one. Which one is freer from politics? Not one. Which has ever shown a finer devotion to the public interest? Not one. Which has so well protected the natural resources in its charge? Not a single one.

I defy any man to give a single tenable reason why the National Forests and the forest interests of the Government and the American people would be better taken care of in the Interior Department, than in the Department of Agriculture. With the possible exception of the National Parks, and I underline the word "possible", the Interior Department has never had control of a single publicly owned natural resource that it has not devastated, wasted, and defiled.

That is the record with which the Interior Department, speaking through the Brownlow Report, comes to ask that the Forest Service, — as good a Government Bureau as ever existed, — shall be taken away from the Department where it has made a clean, efficient, and honorable record for over thirty years, and be returned to the Interior Department, renamed but not freed from its record as the outstanding politically-minded waster of natural resources, since it first had charge of them.

What is behind all this? The ambition of one man is behind it, as it was behind the attempt of Secretary Fall, and the other efforts which have been made to cut the forest steak off the Agricultural cow. The man who has been my friend for more than a quarter of a century has allowed his ambition to get away with his judgment; great power has bred the lust of greater power.

Secretary Ickes will protest, as he has protested before, that under him the Interior Department is pure as the driven snow, and that it is not fair to lay old faults against it. It is not pure as the driven snow, but suppose it were. Secretary Ickes will not live forever.

Every honest Secretary of the Interior I have known, without exception, has been succeeded by a waster. Ballinger followed Garfield. Lane followed Walter Fisher of Chicago. Whatever Ickes may say about his own administration, how can he guarantee his successor? The Interior Department never reforms for long. There is too much political pressure for it to stay good for keeps.

But the Agricultural cow is not the only probable sufferer, if this raid goes through. Nor is additional power for the Interior Department the only dangerous power provided. The Bill to reorganize the Government on the Brownlow basis is now in Committee. It provides a perfectly amazing and utterly unjustifiable increase in the power of the President of the United States. So far as the executive service is concerned it would, to all intents and purposes, abolish Congress.

This bill would authorize the President to do to any government department or agency, or the functions thereof, no less than this: Transfer or retransfer, regroup, coordinate, consolidate, reorganize, segregate any of them, abolish any of them, establish any new one, and prescribe the title, functions, tenure, and method of appointment of its head or of any of its officers or employees.

Is anything left for Congress? If it came to abolishing a department, like Agriculture, or the Municipal Government of the District of Columbia, or the Federal (*Continuing on page* 321)

By DAREL McCONKEY

SASSAFRAS VOYAGE

THE dweller in the hills knows that the blood runs winter-thick in springtime and has need of a medicine to thin it out. The medicine is brewed from the bark of the sassafras root, and is called sassafras tea.

It is old, this spring tonic, and it comes from the Indians, and it has a history.

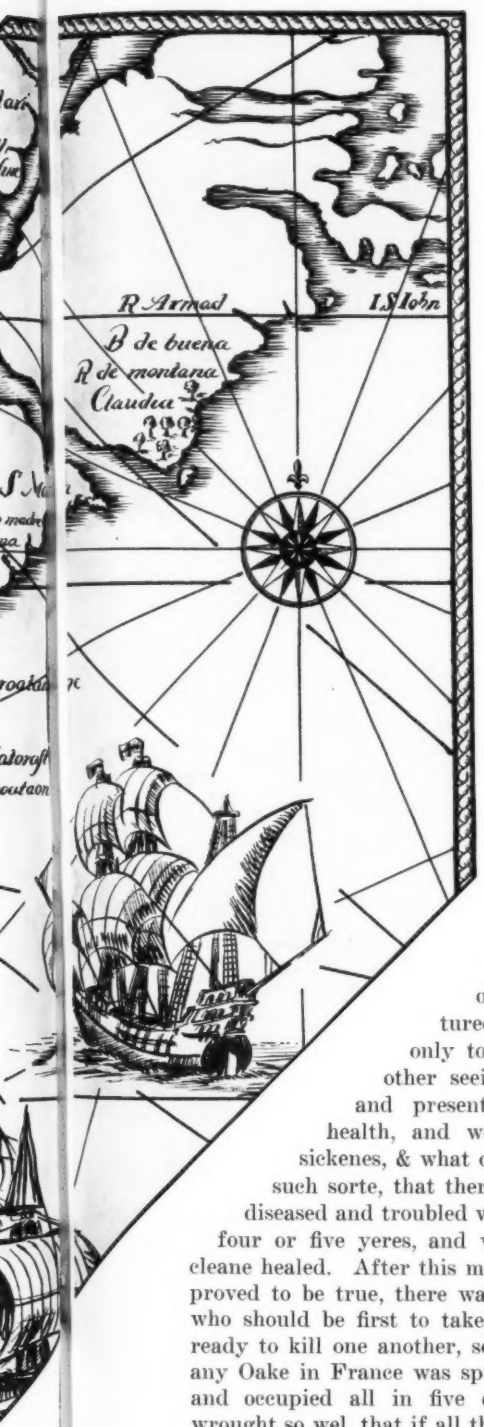
Some authorities say it was probably discovered by the Spanish on the eastern coast of Florida as early as 1528. Certainly it dates back to that sickly winter of 1535-36, and to Jacques Cartier, discoverer of Canada and the St. Lawrence River, first white visitor inland as far as Montreal.

Cartier was spending the winter in Canada, and was having a rough time of it. "Sickenesse was encreased and hot amongst" his men, who were suffering from that old plague of early travelers—scurvy—then called "scorbute."

In despair, one can imagine, Cartier "went foorth of the Forte, and walking upon the yce," saw a band of Indians coming. One of them he recognized as Domagaia, a chief. His surprise must have been great, for "not passing ten or twelve dayes afore" Domagaia "had bene very sicke . . . and had his knees swolne as bigge as a child of two yeres old, all his sinews shrunke together, his teeth spoyled, his gummes rotten, and stinking.

"Our Captaine seeing him whole and sound, was thereat marvellous glad, hoping to understand and know of him how he had healed himselfe, to the end he might ease and help his men." Domagaia, being asked, said "he had taken the juice and sappe of the leaves of a certaine Tree . . . . Then our Captaine asked of him if any were to be had thereabout, desiring him to shew him, for to heale a servant of his," for Cartier was not so rash as to let Domagaia know how many of his men were ill.

"Domagaia straight sent two women to fetch some of it, which brought ten or twelve branches of it, and therewithall shewed the way how to use it, and that is thus, to take the barke and leaves of the sayd tree, and boile them together, then to drinke of the



Two Ships, the *Speed-well* and the *Discoverer*, Came to Northern Virginia, Now Called New England, in the Year 1603, to Gather Sassafras, Sovereign for All Ills

sayd decoction every other day, and to put the dregs of it upon his legs that is sicke . . . . the tree is in their language called Ameda or Hanneda, this is thought to be the Sassafras tree."

Perhaps no more marvelous story has ever been told of a medicine than that which follows.

"Our Captain presently caused some of that drink to be made for his men to drink of it, but there was none durst tast of it, except one or two, who ventured the drinking of it, only to tast & prove it: the other seeing that did the like, and presently recovered their health, and were delivered of that sickenes, & what other disease soever, in such sorte, that there were some had bene diseased and troubled with the French Pockes four or five yeres, and with this drinke were cleane healed. After this medicine was found and proved to be true, there was such strife about it, who should be first to take of it, that they were ready to kill one another, so that a tree as big as any Oake in France was spoiled and lopped bare, and occupied all in five or sixe daies, and it wrought so wel, that if all the phisicians of Mountpelier and Lovaine had bene there with all the drugs of Alexandria, they would not have done so much in one yere, as that tree did in sixe dayes, for it did so prevaile, that as many as used of it, by the grace of God recovered their health."

"The Scorbute that Winter," says another account, "killed five and twentie of their men in their Fort: the rest recovered by the use of the sap and leaves of a tree called Hameda, which was thought to be Sassafras. These reports of Canada, Saguenay, and Hochelaga, caused King Francis to send againe, Anno 1540 . . . ."

So sassafras came, in those days, to have a reputation. In 1574 Nicholas Monardes, "Physician of Seville," printed a work on the medicines of the world, which was "Englished by John Frampton, Merchant anno 1577." The account of sassafras therein reads partially as follows:

"From the Florida whiche is the firme Lande of our Occidentall Indias, liyng in xxv. degrees, thei bryng a woodd and roote of a tree that groweth in those partes, of greate vertues, and great excellencies, that thei heale there with greevous and variable deseases.

"It maie be three yeres paste, that I had knowledge of this Tree, and a Frenche manne whiche had been in those partes, shewed me a peece of it, and tolde me merveiles of his vertues . . . .

"After that the French menne were destroied, our Spaniardes did beginne to waxe sicke, as the Frenche menne had dooen, and some whiche did remaine of them, did shewe it to our Spaniardes, and how thei had cured them selves with the water of this merveilous Tree, and the maner which thei had in the usyng of it, shewed to them by the Indians, who used to cure theim selves therewith, when thei were sicke of any grief . . . and it did in theim greate effectes, that it is almoste incredible . . .

"The name of this Tree as the Indians dooeth name it, is called Pauame, and the Frenche menne doeth call it Sassafras."

It was sovereign, said Monardes, for "Quotidian Agewes . . . large and importunate fevers . . . it comforteth the Liver and the Stomacke . . . Tertian Agewes . . . doth cause lust to meate . . . griefes of the breast caused of cold humors . . . griefes of the head, and paines thereof beeyng very olde . . . them that bee lame or creepelles, and theim that are not able to goe . . . toothe ache . . . the Goute . . . pestilent and contagious deseases," and "it dooeth make fatte."

And Master Richard Hakluyt, preacher, and self-appointed press agent for the English and other voyages, was impressed. He had probably first learned of sassafras (*Continuing on page* 318)

A flock of Dowitchers and Wilson's Phalaropes make a happy landing

Photograph by Lorene Squire

"SANCTUARY"

Nest of the Redhead Duck

A GRAND TOUR OF THE MAJOR REFUGES, WHERE THE WILDLINGS OF THE AIR FIND SANCTUARY

By HOWARD ZAHNISER
United States Biological Survey

U. S. Biological Survey

Baby Bitterns at Blackwater Refuge in Maryland

WE AMERICANS in the past have had strange ways with our wild birds. Depriving them of their natural habitat and depleting their numbers for sport, we have been either heedless of consequences or else blindly trustful in some presumed Power that would take care of the birds no matter what we ourselves might do. It is as though we had taken as a self-sufficient promise the Biblical text, "Birds of the air have nests"—not bothering to wonder where these nests might be in a land increasingly devoted to the more exaggerated needs of civilization.

Fortunately, the Federal Government, with funds totaling around $20,000,000, has at last come to the rescue and is providing the birds with thousands of acres in every section of the country. It is not only acquiring areas but developing them for use of the birds and other wildlife. In the forty-eight States the Federal lands now administered by the United States Department of Agriculture for wild birds total about three million acres. This may not be enough for an altogether adequate program of restoration, but it is a forward step toward that end.

Give these areas the popular term "sanctuaries," or use the official name "refuges"—either will do; both are descriptive. As sanctuaries they provide areas sacred to the uses of wildlife. They afford refuge not only from the hunter's gun but also from the plow, the ax, and the ditch-digger, those disastrous weapons of man's agriculture and settlement. Spread throughout the country, they offer "cities of refuge" to the harassed birds of every flyway, and sanctuaries set apart for every known use of the birds—breeding grounds in the north, resting areas along the far-flung routes of migration, and wintering grounds in the south. All are being developed to meet the food needs of the birds, too. In brief, they constitute a nation-wide system of areas where wild birds can feed, breed, rest, and winter in safety.

An interesting grand tour these bird sanctuaries would provide with their varied conditions and their diverse inhabitants of the wild! Encouraging, also, to see this tangible evidence of a new national attitude toward wildlife! It would be a long tour, for without counting seventy small areas of a special type in North Dakota, there are seventy-five of these refuges in continental United States alone; that is, seventy-five as these words are being written, probably more as they are being read. Happily for a tourist's selection, however, the United States Biological Survey has classified the areas administratively—thirty-four secondary refuges, twenty-eight primary, and thirteen designated as "super"; and the baker's dozen of "super" refuges provide a feasible itinerary, at least for an armchair tour.

From Oregon in the West to North Carolina in the East, from North Dakota to Louisiana in the South, this system of super-refuges covers the country and with the supplementing primary and secondary areas constitutes the nation's answer to the wild birds' needs for natural habitat where they can take refuge and find sanctuary. Malheur in Oregon; Bear River in Utah; Boulder Canyon in Nevada and Arizona; Red Rock in Montana; Lower Souris in North Dakota; Valentine in Nebraska; the Upper Mississippi Refuge in four States; Seney in Michigan; White River

Photographs by
U. S. Biological Survey

REFUGE "FLASHES" EN ROUTE —

The Superintendent at the Malheur Migratory Bird Refuge in Oregon feeds pinioned Canada geese

Birds in the hand — young teal saved from drought and released on the Upper Souris Refuge in North Dakota

A banded mallard is sent on its way — Bear River Migratory Bird Refuge in Utah

Photograph by Lorene Squire

Geese coming down to a prairie wheat field

Photograph by U. S. Biological Survey

Coots rising from the waters of the Tamarac Refuge in Minnesota

WINGS AGAINST THE SKY

in Arkansas; Sabine and Delta in Louisiana; Okefenokee in Georgia; and Lake Mattamuskeet in North Carolina—one who has made this tour has seen an abundance of wildlife and has learned how practicable is a nation-wide restoration program.

In the tules of the Malheur Refuge he may see the nesting places of hundreds of redheads, ruddy ducks, mallards, gadwalls, cinnamon teal, pintails, shovelers, and blue-winged teal. Canada geese are there, too, and many species of shorebirds, including the long-billed curlew, Wilson's snipe, avocet, western willet, Wilson's phalarope, killdeer, and spotted sandpiper. The skies in season are dense with the wheeling flights of California and ring-billed gulls and black and Forster's terns. The picturesque sandhill cranes and white pelicans, with their wonderful beaks of limerick fame, add interest to the refuge, and so do the egrets, black-crowned and Treganza's blue herons, white-faced and glossy ibises, and various species of grebes. Maintained not only for the winged species, the Malheur Refuge like other Federal sanctuaries is also a place where mammals can roam in safety. There are mule deer and antelope and the valuable fur-bearing beaver, raccoon, mink, and muskrat.

With the famous "P" ranch now added to the original refuge established in 1908, the Biological Survey has jurisdiction over nearly 160,000 acres and with them control of practically all the sources of the Donner und Blitzen River, which puts the water into this prize waterfowl area. The story of Malheur is an example of a cycle of events that has become familiar in America. Since old Peter French, the colorful original owner of the "P" ranch, was shot by a

SNOW GEESE — Photographed by Lorene Squire

rival landowner in 1897, livestock companies have made various attempts to "reclaim" it for agriculture. They dammed the Blitzen River to water the bottomlands and succeeded at one time in making it a great hay ranch. With the coming of drought, however, and with too much grazing, Peter French's great cattle empire had become practically useless for agriculture at the time it was taken over by the Biological Survey. With decreasing rainfall and a vanishing water supply, the wildlife that had formerly abounded in the region also decreased alarmingly. But now the Malheur Migratory Bird Refuge is rapidly being restored to its former wilderness condition, and it will be kept so—a great expanse of land, where the tourist who visits the area may see many kinds of rare birds and mammals in their natural habitat.

The second refuge on the tourist's proposed itinerary is 370 miles away in the Bear River Marshes of Utah, two days to the East as the duck flies, or at least as measured by the flight of Redhead No. 36-605799, banded at Malheur on October 25, 1935, and recovered on the Bear River Marshes on October 28. Following a redhead from Oregon to the Bear River Refuge suggests also the fact that many of the redheads that spend their winters in far-off Chesapeake Bay come from these Utah marshes, following that marvelous migration route that takes them first northward, then across the Great Plains, and on to the Susquehanna Flats by way of the Lake Erie Marshes.

The Bear River Refuge comprises 65,000 acres in the greatest wildfowl breeding area of its kind in the Rocky Mountain region. Pintails

and cinnamon teal are the predominating ducks that nest on the refuge, though seven other species breed there, and twenty-two species have been seen there during the spring and fall migrations. It was at this Refuge that investigations led to the Biological Survey's discovery that the so-called "western duck sickness" is a form of botulism, of bacterial origin, and that methods of controlling this disease were developed, reminding one that making an area safe for the birds includes consideration of many things besides the erection of "No Hunting" signs.

Following another duck from the Bear River Refuge, this one southward, might take one to the Boulder Canyon Wildlife Refuge, in the southern tip of Nevada and in Arizona, 622,000 acres set apart as a refuge subject to its primary use for river regulation, navigation, flood control, irrigation, and power-development purposes. Here is the first of the great resting and wintering areas on the refuge itinerary. When cold weather drives them southward, swans, snow geese, many ducks, some shorebirds, waders, and a host of smaller migrants find sanctuary on this refuge, which incidentally demonstrates how wildlife benefits may be realized along with other purposes when the needs of wildlife are considered.

It is a long jaunt to the next refuge on this trip, back across the Bear River Marshes to that part of Montana that stretches down between Wyoming and Idaho. It takes one to the Red Rock Migratory Waterfowl Refuge, which harbors most of the few trumpeter swans left in the United States. Only in this area and on a few lakes in Yellowstone National Park is this majestic species found in this country today. The Biological Survey feels that the preservation of the trumpeter swan alone justifies the establishment of this refuge; but sandhill cranes, long-billed curlews, and more than 200 other species nest about the lakes, and as many as 200,000 ducks have been estimated on the water and marsh areas in fall. High in the Rocky Mountains at an altitude of almost 7,000 feet, the refuge is an area of great scenic beauty—a naturally ideal location for a wild-bird refuge.

To the East, in drought-scourged North Dakota, is an altogether different type of refuge, one that has been virtually created by the Biological Survey. This is the Lower Souris Migratory Waterfowl Refuge extending about forty miles along the Mouse River (called Souris in Canada, after the French way of pronouncing Mouse). This river comes from Canada and makes a huge loop in North Dakota before returning on its way to Hudson Bay. In this loop are really two new refuges. The Upper Souris Refuge, a primary area, includes a dam that stores water for the "super" refuge farther down stream. Four huge dikes on the Lower Souris Refuge create an expanse of nesting marshland for miles along the river. Years ago the Mouse River was an extensive natural breeding ground. Restored, it is beginning again to offer homes for ducks seeking a place to rear their young in safety. Last year thousands of young ducks grew up here, and when the refuge has been developed the Biological Survey expects that it will produce more ducks and geese to the acre than any other area now administered by the Survey. It also winters thousands of sharp-tailed grouse that migrate from Canada when the northern blizzards come.

Migratory birds flying on to the south find another of the "super" refuges in northern Nebraska, the Valentine Migratory Waterfowl Refuge, an oasis of lakes in the sandhills. Mallards, blue-winged teal, pintails, baldpates, redheads, gadwalls, and canvasbacks nest here, and many other species find sanctuary on the refuge during migration. Here, too, the visitor can catch glimpses of sharp-tailed grouse, prairie chickens, eared grebes, white pelicans, great blue herons, blackcrowned night herons, American bitterns, and black terns.

The next area on this armchair tour is a veritable maze of river channels, sloughs, islands, sand bars, lakes, and ponds extending for 284 miles along the picturesque upper Mississippi from Rock Island, Illinois, to Wabasha, Minnesota, including also parts of Iowa and Wisconsin. This is the Upper Mississippi Wildlife and Fish Refuge, one of the most notable wildlife areas in the country. It is located on an important flyway of migratory waterfowl, but it is also an ideal place for shorebirds, upland species, and even beavers and muskrats.

Before going on down the Mississippi to the southern refuges there is a side trip to be worked in to the upper peninsula of Michigan. Here is the site of the Seney Migratory Waterfowl Refuge, a scene of drainage that had to be undone. The Seney Marshes were once a favored area for wildlife. Then somebody began to dig ditches, in the vain hope that crops could be grown on this land that has turned out, after all, to be better for wildlife than for anything else. So the Biological Survey is putting water back into the marshes, and the birds have already found it out. Even with the water-impoundment devices only partially completed, numerous black ducks bred here last year, along with a surprising number of mallards, pintails, blue-winged teal, and ruddy ducks. Beaver, deer, raccoon, and some bear are here too, and so are ruffed grouse, prairie chickens, and some of the few sandhill cranes left in Michigan. A good conservationist of the State donated some 300 pure-blooded Canada geese to the refuge, too, and the Survey is hoping through them to bring back the old honker as a breeding bird in this region.

It may happen that some future goose reared in the Seney Marshes will chance to find his way to the ideal wintering grounds that the Survey is maintaining along the White River, down in Arkansas. At least, anticipating the migrating goose, this itinerary of "super" (*Continuing on page* 320)

EDITORIAL

"Trees Is Trees"

OF ALL the arguments advanced by Secretary Ickes in defense of his scheme to make over the Interior Department into a Department of Conservation and thereby bring under his dominion all the plant and animal resources of the public lands, the most vulnerable is that forestry has nothing to do with agriculture. This argument, of course, is meant to remove one of the fundamental objections to his plan; namely, that it would rend asunder the unity of the government's farm-forest land program.

The mere suggestion that the growing of trees for harvesting is a crop activity that falls within the field of agricultural land management appears to arouse the satirical ire of the Secretary. Taking exception to a recent article in this magazine questioning the soundness of his proposed Department of Conservation, he declared: "Forestry was not transferred to the Department of Agriculture because it was an agricultural function, but since its new affiliation, trees have become a 'growing crop' intending to deceive the gullible into believing that they are an 'agricultural product.' "

Secretary Ickes should know that not only nature but history is against him. Forestry was transferred from the Department of the Interior to the Department of Agriculture in 1905. The transfer was not a happenstance. It was based upon experience in this and other countries in dealing with resources of the soil. President Theodore Roosevelt accomplished the transfer. In his message to Congress on December 6, 1904, he said:

"As I have repeatedly recommended, all the forest work of the government should be concentrated in the Department of Agriculture, where the larger part of that work is already done, * * * * where all problems relating to growth from the soil are already gathered, and where all the sciences auxiliary to forestry are at hand for prompt and effective cooperation. . . . It is true, also, that the forest services of nearly all the great nations of the world are under the respective departments of agriculture."

Working with Theodore Roosevelt to effect the transfer and thus better the management of the public forests, even though it deprived his department of a great resource, E. A. Hitchcock, Secretary of the Interior, declared in his annual report for 1904: "Forestry, dealing as it does with a source of wealth produced by the soil, is properly an agricultural subject. . . . The nature of the subject itself, makes the contemplated transfer . . . of the Forest Reserves to that (Agricultural) Department essential to the best interests, both of the Reserves and of the people who use them."

From this point Secretary Ickes may go backward or forward in history, and he will find the minds of eminent men in agriculture and related fields considering the forest as a crop. At the annual meeting of The American Forestry Association in St. Paul, in 1883, George B. Loring, of Massachusetts, President of the Association and at the time Commissioner of Agriculture, declared in his annual address: "It is time that the skill which has been applied to the cultivation of our great cereal crops, to cotton, rice, tobacco and all the profitable products of the soil . . . should be applied also to the growing of wood as a farm product."

The conception that forestry, dealing as it does with growth from the soil and harvesting of crops of timber, is an integral part of agriculture, runs through the whole history of American forestry. Following Theodore Roosevelt, such eminent Secretaries of Agriculture as D. F. Houston, Henry C. Wallace, father of the present Secretary, and W. M. Jardine, very definitely considered forests as a crop and forestry as "distinctly agricultural business," and President Franklin D. Roosevelt, in 1933, took occasion to remind a group of young Georgia farmers: "It must not be forgotten . . . that trees are as important a crop as wheat, corn and other things grown."

The farms of America contain more acres of trees than any other crop. They contain more acres of trees than the National Forests, the National Parks and the Public Domain combined. Their care and propagation call for the application of scientific knowledge common to agriculture. And trees being trees, whether they grow on the farmer's side of the fence or on the public's side, the same laws of nature apply. The spoken word, even from so ardent a conservationist as Mr. Ickes, cannot change either the records of history or the laws of nature.

"Come and get it!" — a good cooking fire in just a few minutes with two or three cents worth of charcoal — and everything hot but the cook!

CHARCOAL FOR CAMP COOKING

By FRANK J. HALLAUER

THE FIRE is the social center of camp or picnic party, in addition to its strictly utilitarian function in the preparation of food. There is in all of us an atavistic veneration for the spirit of the flame. Around the campfire are related the experiences of the day and are spun the yarns of previous expeditions.

Unfortunately, this attractive part of camp life involves risk to the forest if the campfire is of wood. The city man, viewing a whole mountainside covered with trees, assumes that fuel is abundant and free. The inexperienced camper piles on too much wood and leaves a dangerous fire behind him. The unpracticed woodsman does great damage to young trees and shrubbery in his search for fuel, and too often even the considerate camper, finding no wood to pick up easily, cuts down trees or saplings that for the forest's sake should not be touched.

As Fred H. Arnold, of the National Park Service, states the case: "Campers and picnickers require a constant supply of fuel wood but there is a limit to which the forest of a recreational area can be expected to furnish it. This limit is being exceeded in many places and the ever present need for fuel is fast becoming a very acute problem in certain recreation areas that have been used for some time. The extent to which an area should provide its own fuel wood may well be a question for the forester to decide but the answer in many cases will have to be wood from elsewhere or charcoal. Meeting the demand for fuel does not justify the de-

struction of the recreational forest or its natural appearance."

Mr. Arnold points out the real answer when he suggests charcoal. This fuel is light in weight, clean, cheap and easily transported, when that is necessary; at established sites it is a simple matter to provide a charcoal dispensary. Charcoal may now be bought at concession stands and at roadside fruit and vegetable stands. There is even a "dime in the slot" machine that vends automatically a bag of charcoal together with a small package of kindling wood.

The fact is that people are more and more taking fuel with them for cooking out-of-doors, partly for the reasons already mentioned, but for other reasons as well. Wood fires for cooking have always presented the problem of smoked utensils to be cleaned, the wait for a good bed of coals, or too much heat for summer cooking. Other fuels are now provided in various forms which do not have these drawbacks and are also easily carried. They have an appeal to the tourist, and modern transportation has made the tourist the dominant factor.

The objection may be raised that most of the new fuels sacrifice much of the camp spirit that is associated only with the flickering wood flame or glowing bed of coals. Must we make this sacrifice? True, charcoal cannot simply be piled on the forest floor and ignited, but this problem may be met, as it has been already by some forest and park administrators, by constructing hearths or grills especially designed for the use of a fuel that needs a good draft from below. For example, Jones Beach, in New York, the latest of the wonderful system of state parks on Long Island, has eighty or so such hearths. The rest of the Long Island parks contain about 400.

The management at Bear Mountain Park, New York, after careful study of the problem, has also decided that charcoal is the answer. New fireplaces being installed are designed especially for charcoal and eventually all old fireplaces will be so reconstructed, with the double objective of assisting recreation and at the same time protecting the trees and shrubs.

The *Delineator,* in its issue of September, 1935, described a built-in hearth suitable for back yard or park and offered to supply a drawing giving details.

Our forest and park administrators are doing much to promote ever wider enjoyment of life in the open. This means providing outdoor cooking facilities that are both safe and convenient for the city dweller and that also protect the recreational values that have drawn him to the woods. It means also that those who have known only the convenient gas stove are introduced to the greater esthetic satisfaction to be derived from a charcoal fire, without sacrificing the efficiency of gas.

Of course it is not practicable to build a massive stone or brick hearth at every point where a camper might want to stop and start a charcoal fire going. To meet this need there are on the market a number of collapsible steel grills which can easily be folded up and slipped into the automobile. When need for the fire has passed a dash of water will put it out; the charcoal left over quickly dries and can be preserved for future use. Several models are equipped with handles so that the entire grill may be picked up and dipped into a stream.

Aside from the purpose of building up a better appreciation for true outdoor life and the protection of the forest from fire, friends of the forest should have a further interest in encouraging the use of charcoal. It offers possibilities for the expansion of charcoal markets, and that means new life to one of the older forest industries—wood distillation. The industry cannot produce alcohol and acetic acid except in proportion to its markets for charcoal, and some of those markets have been declining.

Offhand it may be hard to realize that the small amount of charcoal required for a picnic supper could mean much to the hardwood distillation industry. But when it is considered that the number of people who visit our campsites runs into millions, the possibilities are more realistic. A similar multiplication of charcoal fires for cooking in tenements not equipped with gas has in the past provided one of the primary markets for charcoal. Despite the newer apartments with central heating and gas stoves, the domestic market in and around New York City consumes 3,000,000 bushels of charcoal annually.

At present about one-third of the charcoal produced in this country is used for domestic fuel. The "safe and sane" campfires of millions of recreationists might well be expected to double this market.

Charcoal can be bought at many campsites, or it is a simple matter to get a twenty-five cent bag from a fuel dealer and carry it in the car

HOW I FOUND THE RANGER TRAIL

By JOHN RIIS

From the Nebraska "Soddy"

To the Utah Cow Camp

And then to this Ranger Station on the La Sal National Forest

MY FATHER taught me to love trees and all good growing things in the old days back at our home on Long Island. I can see him now, tapping a tall straight pine with his cane on a Sunday afternoon walk.

"Trees are much like people, John," he said. "Some grow tall and straight and clean while others are weak and are bent and crooked by the stronger ones or by the storms of life."

He loved the good earth and found strength in it. Often he would get up from his desk and go out in the garden to dig in the soil or transplant some flower or bush.

"When I strike some knotty problem that I can't get the best of, then I go and dig down in God's good earth with my hands and soon everything comes clear to me," he said.

It was a long cry from that little white house in Richmond Hill with its Danish garden to the wastelands of Utah and all the time the train was carrying me further West. Perhaps, if I could land this Forest Service job, the way would open to something that held a future and would hold me.

It was about time to settle down. Four years I had been knocking about the West. Trying this. Trying that. Trying, unconsciously, to find myself; just as my father had before me when he first came to America, a Danish immigrant boy.

There were many times when the job ran out and the food with it. I washed dishes in a Denver hole-in-the-wall for something to eat. The cook pounded the steak tender and broke up the lump coal with the same hatchet. I made lawns and planted trees for a contractor in Denver; taught delinquent boys the multiplication table and the names of the presidents of the United States in lovable Ben Lindsey's detention home in Denver; worked in the harvest fields in summer and in the towns in winter. But always after a time came the urge to pick up and see what lay over the hill.

So it had gone since I stepped off the train at Hyannis, Nebraska, early one August morning in 1903. The baggage man dumped my little trunk on the wooden platform. There was no one in sight. The sun was just coming up in the east and the train grew smaller and smaller in the west. It gave a faint, derisive toot. A wave of homesickness swept over me.

Up from the depot stretched the wide dirt road that was the main street of Hyannis, flanked on either side by one-story wooden store buildings with the false second-story fronts that were typical of western towns.

John Riis, author of "How I Found the Ranger Trail," is the son of Jacob August Riis, pioneer social reformer and author, whose work is known around the world. After riding the ranger trails of the western National Forests for a number of years, John Riis, like his father, became a newspaper reporter. He is today a successful newspaper man at Richmond, Virginia.

After a hearty breakfast at the hotel, I paid a liveryman six of my precious ten dollars to haul me and my trunk twenty-two miles to the Diamond Bar Ranch, where they needed hay hands. The boss took me on and lodged me in the granary, which had been converted into a bunk house for the harvest season. Nothing was said about wages.

Before sun-up next morning we were hard at it, cutting and raking the wild grass that grew in the valleys and stacking the cured hay under a sun that grew hotter and hotter. They put me on top of the huge stack, stuck a hay fork in my hands and then dumped tons and tons of heavy hay on top of me. I struggled desperately to level it off and build up the stack evenly. The sun beat down from a cloudless sky. Sweat poured off me. A cloud of vicious, biting, flying ants settled over the stack. I began to know what real work is like. When the dinner bell rang and we gathered round the rough table in the "soddy" everything went suddenly round and round and I fell over in a dead faint. Harvesting was a man's job and I wasn't quite a man yet.

That was a hard month on me but harder on the boss. I had everything to learn. They put me on a self-dumping hay rake with a seat so high I could not brace my feet. The little Spanish mules, Jule and Julie, ran away and off we went, knocking down fence posts and shedding parts until at last there was nothing left but the mules, the neck yoke and myself, battered and scratched, hanging on to the lines.

There were agonizing moments in the early dawn when I struggled with a horse collar that hinged in the middle and got no help from the horse. There was a dark night when a mule got into the cow's stall and became so enraged at my natural mistake that he kicked me and the milk pail clear through the side of the flimsy barn.

Gradually I grew more familiar with the strange ways of horses and mules and the stranger ways of harness. When pay day came the boss told me I had broken up more equipment than I was worth and he could pay me nothing for that first month. If I stayed through the winter and made good he would give me fifteen dollars a month and half of that in cattle. I couldn't see much in a half interest in a skinny cow but promised to stay.

When the harvest was over the boss went back to Iowa for the winter and Ancel O'Connor,

(*Continuing on page* 322)

'Twas the day of the old prospector, whose cabin was to be found in almost every gulch

SHAGBARK HICKORY

***Hicoria ovata Miller*, Britton**

By G. H. COLLINGWOOD

SHAGBARK hickory is a distinctly American tree. Only one hickory species exists beyond our continent, and this in eastern China, but during preglacial periods they covered Europe and the Mediterranean countries. Of all the hickories, however, none are so important or widespread as shagbark.

Its irregular, round-topped crown reaches heights of 120 to 140 feet, and the trunk which is frequently divided attains diameters of twenty to thirty inches. It is a common feature of bottomlands and pastures of all the eastern states from southern Maine to southeastern Minnesota, south as far as eastern Texas with the exception of Florida and portions of the Georgia and Carolina coastal plain. Pure stands are rare and best growth is achieved in mixture with oaks and other broad-leafed trees in the Cumberland Mountains and Mississippi River bottoms. Under forest conditions the straight trunk may be clear of branches for fifty to sixty feet.

The compound leaves arranged alternately on the stem, have five or seven leaflets whose narrow base is attached directly to the leaf stalk. The three outer leaflets are four to six inches long while the lower ones are smaller. Narrow at the base, wide at the top, the margin of each leaflet is toothed and the shape described as obovate.

In May or June while the leaves are developing, separate male and female blossoms appear at the base of new shoots. The drooping spikes of staminate flowers are four to six inches long, while the two to five flowered pistillate ones—one-third of an inch long—are covered with a rusty wooly growth. Those which are fertilized develop during the summer into green semi-spherical fruits one-fourth to two and a half inches in diameter. This is described as ovate and is responsible for the name *ovata* to distinguish this *Hicoria* from other hickories. The thick outer husk splits into four sections when ripe and reveals a single, white, thin-shelled nut whose sweet kernel is edible. These fruits ripen with the frosts of October, are sought after by squirrels, and are the small hickory nuts of commerce.

When the leaves drop conspicuous, slightly elevated, roughly heart-shaped, leaf scars are left on the twig to persist two or more years. At the base of the leaf stalk and in the curve of the leaf scar a blunt-pointed, broadly ovate bud is completely formed before fall. The terminal bud is one-half to three-fourths of an inch long, blunt-pointed, and covered with slightly downy, dark brown scales. A cross-section of the twig reveals an obscure five-pointed star of dark colored pith.

The long, flat plates of gray bark of mature trees,

Regardless of season, Shagbark Hickory is a rugged, picturesque tree with a strong, frequently divided trunk. Heights of 120 to 140 feet are attained, with trunk diameters of twenty to thirty inches

loose at one or both ends, give the name "shagbark." On young trunks, the bark is smooth, firm and light gray.

The reddish brown heartwood was long considered inferior in strength and toughness to the surrounding two to four inches of white sapwood, but laboratory tests show no material difference. No other commercial wood has the combination of strength, toughness, and elasticity, and no other American hardwood could adequately substitute for hickory in case of shortage of supply. It is, however, not durable in contact with the soil and is subject to attacks by boring insects.

Hickory lumber having no more than twenty rings to the inch is generally the strongest, and is used for handles of axes, picks, hammers, and hatchets. Until recently large amounts were used in making spokes and rims of wheels, singletrees, and buggy shafts. Increasing quantities are used in athletic equipment. Hickory wood weighs about sixty-three pounds to the cubic foot when air dry and is admirable for fuel.

Nearly half the present stand of 16,000,000,000 board feet grows in the lower Mississippi Valley. The production of hickory lumber has declined from 334,000,000 board feet in 1909 to 22,264,000 board feet in 1935. Three-fourths of this came from Mississippi, Kentucky, Louisiana, Arkansas, Indiana, Tennessee and Ohio.

Hickory is reproduced from seeds and sprouts. Two to three bushels of shelled nuts may be produced by thrifty, open-grown trees. Trees of seedling origin grow slowly, but may reach ages of 150 to 200 years. The hickories are attacked by various insects, but suffer greatest harm from the hickory bark beetle which causes the death of many trees in the north.

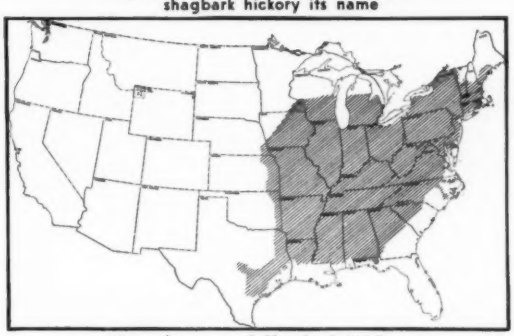
Charles F. Steiger

Above—Hickory nut enclosed in husk. Below—The compound leaf has five and rarely seven leaflets

Drooping spikes of staminate flowers

George J. Baetzhold

Long, loose plates of gray bark give shagbark hickory its name



Natural range of Shagbark Hickory

CONTROLLING MAD WATERS

(*Continued from page* 281)

Whereas, storage in reasonably well-situated large reservoirs can in many instances be had at a construction cost of twenty to thirty dollars per acre-foot, the average farm in rolling country will not provide a site for storing small quantities behind safe and permanent structures at less than about $1,000 per acre-foot. The annual charge for such storage, therefore, is a matter of some fifty dollars per acre-foot, while for feasible storage in larger nearby valleys the annual charge may be a matter of one dollar to one dollar and fifty cents per acre-foot. This charge is independent of the frequency of filling of the reservoirs, and does not include flowage rights.

Complete storage of water in the ground, while the land is being used for either field crops or pastures, is not easily accomplished, and it is necessary by and large, that the Mississippi Valley be devoted primarily to agricultural uses. Approved methods of land treatment and cropping, for erosion control, will commonly do much to decrease the total runoff. But under tillage or intensive pasturing, at the most critical times,—the spring seasons of snow-melting and of early rains,—when Valley floods are likely to develop, heavy runoff from most farm lands, exclusive of the level areas, will usually be witnessed.

On the other hand, there are millions of acres of upland in the very heart of the Mississippi basin devoted now in part to forest-growing and generally to some grazing use, each acre of which, if protected from fire and grazing for a few years, might be made to guarantee absolute freedom from any substantial amount of runoff,—absolute, complete, and effective storage of rainfall in any conceivable amount.

This is in no sense an academic conclusion, as has been the basis for so-called "scientific" statements for a long time past, such as the assumption that the effectiveness of forest in flood rains is limited to the storage capacity of the forest litter, and to an amount of one-half inch or less of rainfall. Such a limitation is positively absurd, as will shortly be demonstrated.

I venture the opinion that during January, 1937, there were thousands of acres of well-protected farm woods (only a small proportion of farm woods are given a chance to be effective) on the uplands of the Ohio drainage from which only the barest trickle of surface runoff occurred although they may have received twelve inches or more of rain, and that no appreciable contribution was made to flood-flow from them, other than the gradual draining away of groundwater which occurs, with little variation, year in and year out.

These positive statements deserve far more elaboration than space here will permit. The following two statements will furnish a sample of the kind of evidence which is now available:

1. A forested watershed on thirty per cent slope at La Crosse, Wisconsin, and having a stiff silt-loam soil, highly erosive when exposed, has been protected since early 1932, prior to which it was grazed, and gullied by water passing through it from fields above. With this water of external origin diverted, there has been approximately 0.3 inch of total runoff in the three years 1934-36, while the total rainfall has exceeded ninety inches. The greatest concentration of rain has been 6.11 inches in a six-day period in August, 1935, during which the runoff was less than 0.03 inch. The occurrence of precipitation in this section of the Mississippi Valley is such that forested land, at intervals, and within individual flood-building periods, stores 2 to 2.5 inches of water more than does land in agricultural use. This amount may sometime be exceeded, but seems to be a common probable maximum. An acre of forest land, therefore, by guaranteeing this storage, or more if necessary, has a public value equal to the cost (annual charge) of providing about one-fifth acre-foot of reservoir storage, which, locally, may be thirty cents or more. This is far more than enough to justify complete exemption of taxes assessed private owners, if the protective value is maintained by exclusion of fire and by very limited grazing.

2. On a farm close to the Ohio River where about ten inches of rain were received in January, 1937, the runoff from farm land cropped in 1936 was roughly six inches more than from forest land. The latter is reported not to have been in first-class condition and did yield some three inches of runoff. But the assumption that upland forest soils in that region become "water-logged" in such protracted rains, because they are of clayey character, is wholly unjustified.

It is true that with a large proportion of clay the rate at which water, inducted by the humus layer, moves into the subsoil, may have a lower limit than in other cases. This definitely does not limit the total amount that can be stored, but may lead to some surface runoff during high-intensity rains, which occurred on two days of the January series. With such flood-producing rains as the Ohio Valley experiences, upland forests may well have an annual value of seventy-five cents to one dollar per acre when compared with reservoir costs.

Intelligent understanding of the part which can be played by forests in flood control requires recognition that the entire underlying structure of the land is involved in the term "watershed," and that at least three distinct conditions exist in nature, the water relations of which are very different. (*Continuing on page* 321)

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AROUND THE STATES

FARM FORESTRY BILL ENACTED

Distribution of trees for forest planting and for farm shelterbelts, the giving of advice to owners of farm woodlands and tree plantings, together with authority to make investigations is provided for under the Norris-Doxey Farm Forestry Act passed by the House on May 5 and by the Senate on May 6. The original Norris bill, S. 1504, had been passed by the Senate on April 20, but after the record vote of 171 to 153 in the House, the Doxey bill was reenacted by the Senate. This is the first important forestry law to be passed by Congress since the Fulmer Act of August 29, 1935.

The Act authorizes annual appropriations of $2,500,000 that the Secretary of Agriculture "in cooperation with the Land Grant Colleges and Universities and state forestry agencies, each within its respective field of activities," may grow, procure and distribute forest trees and shrub planting stock; advise farmers regarding the establishment, protection, management, and marketing of farm forests or forest and shrub plantations; enter into cooperative agreements for establishing, protecting, and caring for tree and shrub plantings; and engage in necessary investigations. Without specifically mentioning the Great Plains Shelterbelt, the Act is understood to give authority to carry forward the plantings in that region through cooperation with the states and individual landowners.

The new Act is similar to the Clarke-McNary Act but does not displace it. Under that law $56,838 is available for cooperative farm forestry extension work in thirty-three states and Puerto Rico, while with $70,579 the Forest Service cooperates with forty states and two territories in growing and distributing over 25,000,000 trees. By eliminating the clause requiring the states and property owners to provide one-half of the cost, the new Act promises an expansion of farm forestry work and tree planting far beyond that now undertaken with Clarke-McNary funds.

Opposition to the bill was voiced on the floor of the House by several Congressmen speaking for commercial nurserymen who feared the authority given the Secretary of Agriculture would cause the government to encroach upon their business. To meet this, Representative Harold D. Cooley, of North Carolina, submitted the following statement of the Department's policy of relationship with commercial nurserymen, signed by Chief Forester F. A. Silcox:

"In case legislation providing for cooperation in the development of farm forestry is enacted, the Forest Service will be guided by the following policy in the administration of the act insofar as it is administered by the Forest Service:

"(1) The Forest Service will not permit planting stock grown in either Federal or cooperative nurseries to enter commercial channels. It will not permit the use of planting stock for landscaping or ornamental purposes on private land or for protective planting about the home site, including structures, gardens, and orchards.

"(2) The Forest Service will not permit the distribution of stock from Federal or cooperative nurseries that is more than four years of age or more than five feet in height above the ground.

"(3) The Forest Service will not dispose of less than 500 trees to any one individual or any one planting operation.

"(4) Where established commercial nursery facilities are available the Forest Service will not develop federally owned, or cooperatively financed nurseries for the production of planting stock to be distributed to farmers or others, provided the commercial nurseries can and will cooperate to the extent of producing planting stock in sufficient quantities and at satisfactory prices, as compared with the cost of production in public nurseries; also provided commercial nurseries will produce planting stock of suitable species, sizes, quality, and seed sources. Certification as to conformance with specifications will be required.

"(5) As a general policy the Forest Service will cooperate with commercial nurseries, utilizing their established sources of production in the maximum degree where not contrary to the public interests and where this can be done without injury to the individuals with whom cooperative planting projects are being carried on."

ROBERT MARSHALL
New Chief of Recreation, Forest Service

FORSLING AND MARSHALL APPOINTED

Appointment of C. L. Forsling to be assistant chief forester in charge of all research activities, and of Robert Marshall to be chief of the Division of Recreation, was announced by the Forest Service early in May. Mr. Forsling at present is director of the Appalachian Forest Experiment Station, Asheville, North Carolina, and Mr. Marshall is chief forester for the Indian Service.

As assistant chief forester, Mr. Forsling will supervise the work of the Divisions of Silvics, Forest Influences, Range Research, Forest Products and Forest Economics, which are carrying on specialized investigations in the protection and management of forest and range lands, utilization of wood, and other phases of forestry. Among the important projects in the Forest Service research program is a nation-wide survey of present and potential timber resources.

Mr. Marshall will have charge of the development of recreational facilities and the handling of public recreation use in the 156 National Forests. More than 23,000,000 persons visited the National Forests for recreational purposes last year. This creates a heavy pressure for the development of facilities to take care of constantly increasing numbers of visitors.

MINNESOTA COMMISSION ABOLISHED

According to a press dispatch, a bill to abolish the five-man Conservation Commission in Minnesota was passed by the State House of Representatives early in May by a vote of 101 to 3. The Senate already has passed the measure.

The Senate bill was amended, however, to leave unmolested the money received from game and fish license fees instead of depositing it in the general revenue fund. The Senate is expected to concur in the House amendment, it was reported.

Action by the Legislature marked the termination of a stormy career of the non-salaried board, which has been criticized by two consecutive governors and has drawn the fire of sportsmen's groups for unpopular game laws, it was said.

Under provisions of the bill, introduced by request of Governor Benson, a commissioner would be appointed at an annual salary of $6,000 for a six-year term, and would be removable for cause only.

The bill further provides that the department would be organized with the following divisions:

Forestry, Drainage and Waters, Game and Fish, Lands and Minerals, and State Parks, with each division under the immediate charge of a director. All, however, would be subject to the general supervision and control of the commissioner and would be appointed to serve at his pleasure. Each director would receive an annual salary of not more than $4,000.

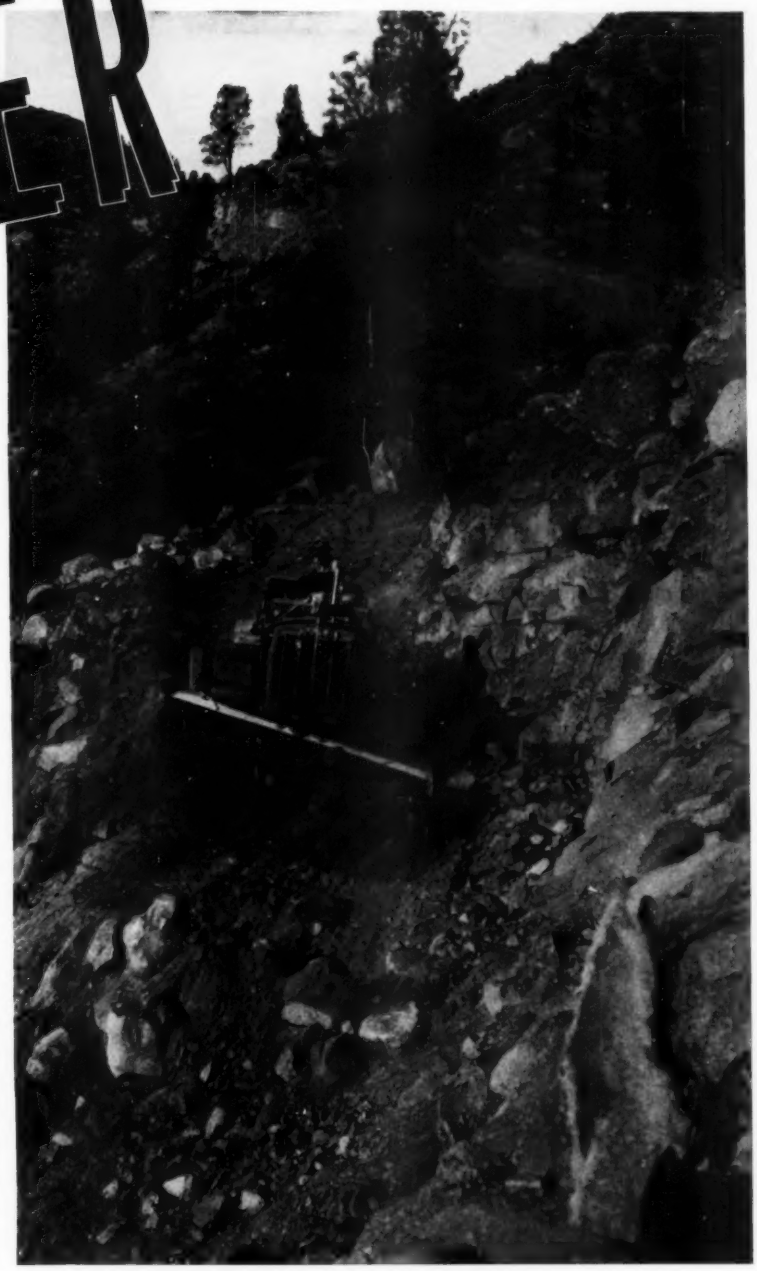
OKEFENOKEE SWAMP NOW SANCTUARY

The vast primeval wilderness of the Okefenokee Swamp in southeastern Georgia where the ivory-billed woodpecker, limpkin or "crying bird," otter, and other fast-dwindling wild birds and animals still find refuge, will be maintained as a wildlife sanctuary by the Biological Survey. It has been named the Okefenokee Wildlife Refuge.

A total of 479,450 acres has been included in the ultimate boundary by an Executive Order establishing the refuge. The Biological Survey already has acquired 293,825 acres of this land. Little development work will be undertaken there, as the Survey plans to preserve the swamp in its natural state.

The swamp is largely a wet timbered area containing an uneven stand of cypress, gum, bay and red maple, with such undergrowth as greenbrier and ti-ti bush. Most of the cypress trees are festooned with Spanish moss. Within the swamp are many marshlike open spaces, locally called "prairies." They contain scattered hummocks covered with cypress trees or brush, which in some instances extend over a thousand acres. Also there are many islands that are fairly high and dry. Timber, composed chiefly of longleaf and slash pines, surrounds the swamp.

POWER TO MOVE A MOUNTAIN!



PUSHING over huge rocks and slicing off big loads of earth, this U. S. Forest Service heavy-duty "Caterpillar" Diesel RD8 Tractor with LeTourneau Angledozer is carving a new Forest Service road down a mountain in Tulare County, Calif. It takes a lot of power to handle this sort of job, but the Diesel engine provides plenty — on less than 2½ gallons of low-cost Diesel fuel per hour.

Building patrol roads and fire guards are regular jobs for the "Caterpillar" Diesel Tractor. With a heavy blade in front—or a grader, ripper or scraper behind — it builds miles of roads, trails or ditches — at lowest possible cost. Hundreds of "Caterpillar" Diesel Tractors are at work for the U. S. Forest Service today.

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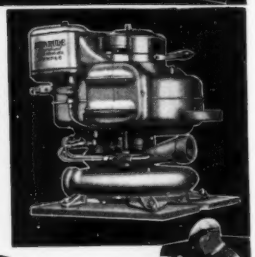

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WISCONSIN'S RECORD FISH PROGRAM

The largest fish propagation program ever undertaken in the United States is now under way on Wisconsin lakes and streams. The Wisconsin Conservation Department is beginning its work of gathering sufficient spawn to permit the hatching and planting of 1,000,000,000 fish in Wisconsin waters this year.

While no accurate forecast can be made in advance as to the proportion of the various species to be hatched, H. W. MacKenzie, director of Wisconsin conservation, explained that particular emphasis is being placed on the hatching and planting of 20,000,000 muskellunge. This fish, largest and most highly prized of all fresh water game fish is found in upward of 300 Wisconsin lakes and rivers.

FORESTERS ELECT CLEPPER

The council of the Society of American Foresters has appointed Henry E. Clepper executive secretary of that body and managing editor of the *Journal of Forestry*. He took office May 17.

A native of Pennsylvania, Mr. Clepper was graduated from the Pennsylvania State Forest Academy in 1921. He served as district forester of three Pennsylvania State Forest districts, as state leader of white pine blister rust control, as senior research forester of the Pennsylvania Forest Research Institute, and as assistant chief of the Bureau of Research and Information, Pennsylvania Department of Forests and Waters. Recently he became associated with the United States Forest Service in the Division of Information and Education.

CORNELL DISCONTINUES FORESTRY

Cornell University's instruction in professional forestry, undergraduate as well as graduate since 1910 in the New York State College of Agriculture, will be discontinued at the close of the present school year. Beginning July 1, 1937, all instruction in forestry, except that having to do with farm or woodland forestry will be concentrated in the New York State College of Forestry, at Syracuse.

This action was taken as a result of suggestions made by the Board of Regents of the University of the State of New York, the trustees of Cornell University and of the New York State College of Forestry. Accordingly, the granting of degrees of Master of Forestry to graduate students of forestry now at Cornell at the end of the present college year will bring to a close the conduct of professional courses in forestry at Cornell. Cornell was the first college for advanced study of technical forestry in America.

FLOOD STUDY URGED BY PRESIDENT

Recommendations that Congress undertake a broad study of flood control and drainage legislation, designed to provide an integrated system of water conservation for the nation, were submitted on May 12 in a special message from President Roosevelt.

The message accompanied the report of the Up-Stream Engineering Conference held in Washington last September in a volume entitled "Headwaters Control and Use." The report presents basic scientific concepts and data concerning the behavior of waters between the rain drop and the river stages and develops new techniques for application of fundamental principles to the beneficial control and use of little waters.

"It is becoming increasingly apparent that big waters are not the only part of our water resources presenting problems and requiring constructive treatment," declared the President in his message. "Little waters also are of critical importance. In fact, with respect to some problems, drainage basins must be treated as a whole, both headwaters and main channels of any river system being brought into an integrated program of regulation."

Coming as it does while Congress is considering a number of flood control and river regulation measures, the message may influence the early passage of a broad Federal plan of flood control.

NEW TREE PLANTING RECORD

Approximately 215,000,000 trees were planted by the Forest Service on National Forests in twenty-six states during the past year—the greatest reforestation program yet recorded, topping the previous all-time high mark set in 1935 by more than sixty per cent.

Tree nursery production was geared to meet the demand. During 1936, more than 237,500,000 tree seedlings, including those furnished cooperating agencies, were produced by fifteen Forest Service nurseries in eleven states.

Nearly ninety per cent of the total planting was done in National Forests in the Lake States in the South. The Lake States region, which embraces Illinois, Indiana, Michigan, Minnesota, Missouri, Ohio, North Dakota and Wisconsin, reported the reforestation of 141,478 acres, which represents the planting of more than 140,000,000 trees. In Michigan alone, 78,000,000 trees were planted. Wisconsin was in second place with 40,000,000 trees planted on its National Forests.

In the South, where approximately 55,000,000 trees were planted, Louisiana and Mississippi each reported the planting of 22,000,000 trees—mainly longleaf, slash and loblolly pine.

The 1936 planting program in the National Forests west of the Great Plains saw the reforestation of nearly 20,000 acres, requiring approximately 19,000,000 trees. Five million were planted in Idaho; National Forests of Washington and California reported the planting of 3,000,000 trees each. Colorado, Nebraska and Montana were next, with plantings ranging from 2,500,000 to 1,400,000 trees.

In the East, West Virginia and Pennsylvania National Forests received well over a million trees each; about a half-million were planted on National Forest land in New Hampshire.

Michigan led in the output of tree seedlings from Forest Service nurseries.

GREETINGS . . . .

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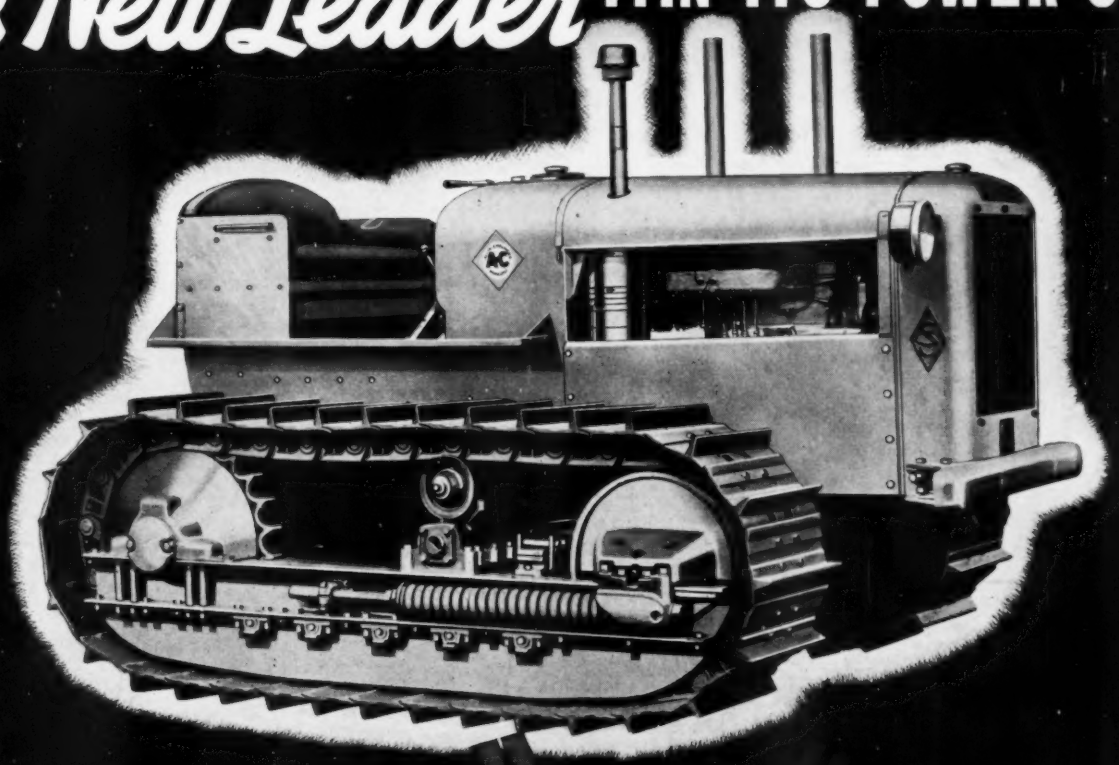

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READERS' FORUM

IT HAPPENS IN FLORIDA

SIR: I often wonder whether the Association realizes what is going on in south Florida.

When I first saw this part of the country there was a magnificent stand of Carribean pine covering most of the coastal plain counties and extending far inland in many places. This is being converted into waste land about as fast as it could be done, and at a time when the government is spending millions to replant forests.

Here is the process. Some large operator buys the land for a dollar or so an acre from the state, butchers the timber and allows it to go back to the state for delinquent taxes, in spite of the law requiring the payment of taxes if timber is removed.

First of all the best timber is cut. Then someone cuts the remaining large timber for railroad ties, removing the chance of reseeding. Finally even the seedlings are cut and the whole thing burned over year after year until there is nothing left. Neither the State nor the Federal Government raises a hand to stop it.

Is there any hope of relief from these outrages?—*Thomas M. Biggar,* Fort Myers, Florida.

MAN'S BLUNDERING AND FLOODS

SIR: We seem to blunder fearfully in our efforts to cope with floods, droughts, erosion and soil disasters. Certainly we have failed. Why? Have we not failed because of our complacent optimism, and our laziness, and our lack of general cooperation in promoting wide extended conservation?

Surely for us the time for repentance and reform has arrived. We need to clearly define our new task and to dedicate to it an energy and a persistence comparable to that ignorantly used in consumating the partial or entire destruction of field, forest and stream resources.

Considered aright ours is one of the noblest tasks ever committed to any people. That task is a trinity of achievements worthy our advanced knowledge and resources, the task of developing field, forest and stream to a productiveness, even exceeding that known to our pioneers.

After our unpardonable neglect of conservation there remains in bright prospect for us this newly restored promised land, in which as repentant prodigals we may atone for the mistakes of our past.—*O. C. Charlton,* Dallas, Texas.

WANTED—A WAY

SIR: On September 9, I sent the following letter to President Roosevelt:

"For the past several years I have owned and occupied a farm near the upper entrance to Enfield Glen. In normal times we have three creeks on our place. In past years entirely too much wood was removed so that now the farm is somewhat of a menace to the entire district.

"We have all the conditions described in many newspapers and magazine articles which emphasize the necessity of measures to prevent soil erosion and to hold back flood waters. The water that runs off our farm has caused considerable road damage each year we have been here and during the flood of something more than a year ago this run-off caused an enormous amount of damage and expense.

"I have been to various agencies in a vain endeavor to remedy conditions—I am always told that work is being done some other place, never here. To do some reforesting would well repay the county, the state or the National Government, but so far I have been utterly unable to get any cooperation.

"The soil erosion people, for instance, talked entirely in terms of potatoes. They will show me how to grow two bushels of potatoes where now I get but one. I could not make them understand that I am not interested in growing more potatoes, that I only want to stop roads from washing out, to have water when needed.

"The CCC camp in this neighborhood confines its work entirely to the state park and, as far as I have been able to find out, do absolutely nothing for the community in general. It so happened that one of our creeks contributed largely to the enormous damage in the park but they do not mind this—they say it is the business of the soil erosion people. And so I get a perfect run-around.

"I am very much in sympathy with the objectives you mention in your speeches and will be very grateful for information regarding how to really get something done or if this letter can be referred to some one who will really do something. I am willing to take land out of cultivation or do anything to help matters."

This letter was referred to the Department of Agriculture. They referred it to J. A. Cope, extension forester of the State of New York, at Ithaca. Mr. Cope says that if I want to do anything it will be O. K. with him—and so again I am back at the starting point.—*B. L. Madden,* Ithaca, New York.

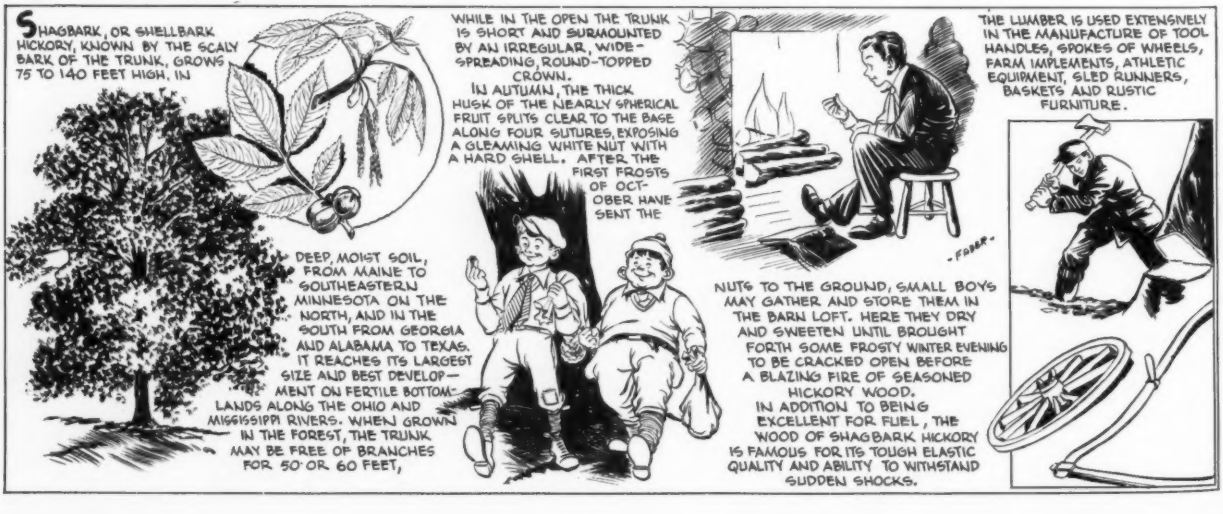
TREES—PRODUCT OF THE SOIL

SIR: In the Forester's Bulletin of April 24, you quote Representative Cannon as saying: "Forestry is not an agricultural activity, and the purpose for which this money is being spent is more to the interest of industry and to labor than to agriculture. The production and manufacture of lumber and wood products is an industrial function and the farmer's interest in forest activities is only indirect, and yet the appropriation for forestry is one of the items contributing materially to the large amount provided in this bill."

To me, this makes as much sense as to say that raising the corn that is used for certain grades of paper is not an agricultural function, or the soy beans that are used for all manner of products resembling and rivaling bakelite in their variety. It seems to me that we will never get anywhere with the idea of a definite division of departmental duties and functions, until we get down to the fundamental thought as expressed by your organization that everything belongs to the Agricultural Department that is the product of the soil.

There is such a thing as tree farming, just as much as there is wheat or cotton farming. I believe we must educate the Congress to this, and it would be, in my opinion, a calamity to have a realignment of departmental function and responsibility based on any other thought.—*Otto C. Doering,* Chicago, Illinois.

TREES AND THEIR USES—No. 25—SHAGBARK HICKORY


SHAGBARK, OR SHELLBARK HICKORY, KNOWN BY THE SCALY BARK OF THE TRUNK, GROWS 75 TO 140 FEET HIGH, IN
DEEP, MOIST SOIL, FROM MAINE TO SOUTHEASTERN MINNESOTA ON THE NORTH, AND IN THE SOUTH FROM GEORGIA AND ALABAMA TO TEXAS. IT REACHES ITS LARGEST SIZE AND BEST DEVELOPMENT ON FERTILE BOTTOM-LANDS ALONG THE OHIO AND MISSISSIPPI RIVERS. WHEN GROWN IN THE FOREST, THE TRUNK MAY BE FREE OF BRANCHES FOR 50 OR 60 FEET,
WHILE IN THE OPEN THE TRUNK IS SHORT AND SURMOUNTED BY AN IRREGULAR, WIDE-SPREADING, ROUND-TOPPED CROWN.
IN AUTUMN, THE THICK HUSK OF THE NEARLY SPHERICAL FRUIT SPLITS CLEAR TO THE BASE ALONG FOUR SUTURES, EXPOSING A GLEAMING WHITE NUT WITH A HARD SHELL. AFTER THE FIRST FROSTS OF OCTOBER HAVE SENT THE
NUTS TO THE GROUND, SMALL BOYS MAY GATHER AND STORE THEM IN THE BARN LOFT. HERE THEY DRY AND SWEETEN UNTIL BROUGHT FORTH SOME FROSTY WINTER EVENING TO BE CRACKED OPEN BEFORE A BLAZING FIRE OF SEASONED HICKORY WOOD.
IN ADDITION TO BEING EXCELLENT FOR FUEL, THE WOOD OF SHAGBARK HICKORY IS FAMOUS FOR ITS TOUGH ELASTIC QUALITY AND ABILITY TO WITHSTAND SUDDEN SHOCKS.
THE LUMBER IS USED EXTENSIVELY IN THE MANUFACTURE OF TOOL HANDLES, SPOKES OF WHEELS, FARM IMPLEMENTS, athletic EQUIPMENT, SLED RUNNERS, BASKETS AND RUSTIC FURNITURE.
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FORESTRY IN CONGRESS

By G. H. COLLINGWOOD

Evidence of the forces for economy in Congress which have been gathering strength were shown on May 12 when Representative Connery's bill, H. R. 6551, to make the Civilian Conservation Corps permanent, passed the House, 384 to 7, amended to limit the life of the CCC to the two years following July 1, 1937. The salary of Director Robert Fechner was cut from $12,000 to $10,000, but the pay of enrollees continues at $30.00 a month. The bill provides that young men between the ages of seventeen and twenty-three who are unemployed and in needy circumstances, regardless of whether their families are on relief, are eligible for enrollment. It provides also that ten hours out of each forty-hour work week may be devoted to general educational and vocational training, but application of the merit system to all employees was struck out. As reported to the Senate on May 13, 300,000 young men and war veterans, together with 10,000 Indians and 5,000 men from the Territories and insular possessions, may be enrolled.

On May 12 the Agricultural Appropriation Bill, H. R. 6523, was reported to the Senate with $500,000 lopped from forest purchases, reducing the appropriation to the Budget figure of $2,500,000. The Budget estimate of $1,000,000 for purchases of land for the States under the Fulmer Act continued to be omitted in spite of extensive arguments by Chief Forester Silcox, supported by Senators Ellison D. Smith of South Carolina and Royal S. Copeland of New York, State Forester F. W. Besley of Maryland and Perry H. Merrill of Vermont.

The appropriation for Dutch elm disease eradication was increased from the House figure of $421,720 to $500,000 as approved in the Budget, but the Appropriation Committee ignored the request for $3,000,000 recommended by the National Conference on Dutch Elm Disease.

Amounts aggregating $79,909 were restored to the Forest Service, bringing the total to $18,389,682. The small restorations included $20,000 to the Forest Products Laboratory for studies in paper making and chemical seasoning of wood; $24,909 for forest management studies in the Southwest, California, and the Central States; $10,000 for range investigations; and $15,000 for forest economic studies. An increase of $3,000,000 for Forest Roads and Trails was also included.

The Senate Committee restored $39,738 for Forest Insect studies, and $7,500 for studies of food habits of birds and animals, but cut out the $12,000 for control of predatory animals and rodents by which the House had exceeded the Biological Survey's budget.

No additions were made to the Soil Conservation Service, but $175,000 was taken away. This further reduces the amount available for research, demonstration and administration and leaves $24,265,780 for that bureau.

Appropriations for the Department of the Interior totaling $115,871,264.85 were presented to the House on May 11 as H. R. 6958. The sum provided in this bill is $5,773,996.61 less than the current appropriation and $4,741,340 below the Budget estimate, but includes increases of $2,375,300 for the National Park Service.

The total appropriation for the National Park Service is $18,611,380, of which nearly half is designated for the public buildings, grounds, and National Capital Parks in the District of Columbia, $4,500,000 for the construction of roads and trails, and $3,000,000 for the Blue Ridge and Natchez Trace Highways, leaving scarcely $3,000,000 for the National Parks and Monuments.

The committee recommended the establishment of a schedule of fees for admission to and use of the National Parks which would return nearly $1,750,000, placing them more nearly on a self-supporting basis. Fees now charged for automobile and motorcycle permits, guide and elevator fees, and the use of public facilities in the National Parks gave a total revenue of $1,091,409.50 during the fiscal year 1936.

A total of $800,000 is recommended for the Division of Grazing, which is $150,000 more than the current appropriation. The larger sum is due to the increased duties caused by expanding the area included in grazing districts from 80,000,000 to 142,000,000 acres as provided in the Act of June 26, 1936. Receipts from grazing fees during the next fiscal year are expected to reach $1,000,000, of which one-fourth is available for range improvements, one-half will be distributed to the states in which the grazing districts are established, and one-fourth is retained in the Treasury.

A continuation of the current appropriation of $260,000 for the administration and protection of Indian forests is recommended.

The published hearings reveal that on April 7 Secretary Ickes renewed his argument in favor of changing the name of his department to the Department of Conservation.

On April 30 the bill, H. R. 5394, to authorize purchase of the Carl Inn tract containing some 7,500 acres of sugar pine land belonging to the Yosemite Park Sugar Pine Lumber Company and adjacent to the Yosemite National Park, was reported favorably and placed on the House Calendar. The land is adjacent to areas aggregating 15,570 acres which were acquired a few years ago by the Federal Government in cooperation with Mr. John D. Rockefeller, Jr., at a total cost of $3,298,685.50. The proposed purchase contains, according to various estimates, between 308,000,000 board feet and 330,750,000 board feet of standing timber, about half of which is sugar pine in mixture with ponderosa pine and other species. It has not been appraised and no value was revealed during the hearings. The Secretary of Agriculture has approved provision for the transfer to the Yosemite National Park of approximately 476 acres of National Forest land.

The bill also proposes payment of between $36,000 and $52,000 to the counties of Tuolumne, Mariposa, and Merced to compensate for the loss of expected taxes.

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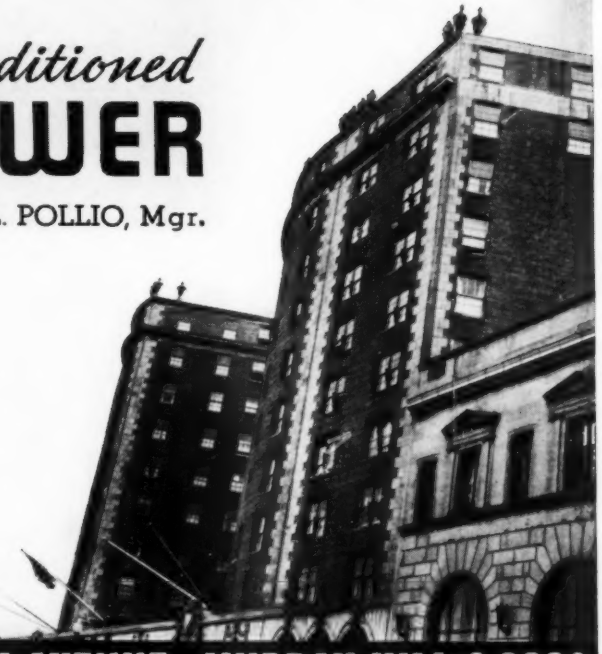

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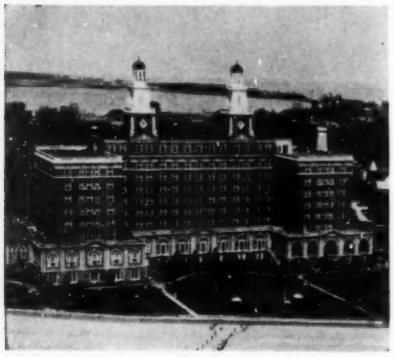

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FOREST TRAVELOGUE

A PLACE TO PARK YOUR TRAILER

America's trailer nomads who take to the road this summer will find the Civilian Conservation Corps on the job preparing stopping places for them in state parks throughout the nation.

The development of trailer parking areas has been carried out by CCC men as a part of the programs of recreational development. In some parks, specially equipped trailer camps will be ready for use this season, but in many areas it will take another year or so for the completion of sites equipped for the particular needs of trailer owners.

The eastern and north central states offer some of the best state park trailer campsites now ready for use, it is reported. Selkirk Shores State Park, on Lake Ontario near Pulaski, New York, has a long-established trailer camp situated on a level shelf atop a bluff overlooking the lake and beach. So popular is this place that the CCC last summer doubled the capacity of the camp. A fine trailer camp at Mohawk Trail State Forest, Charlemont, Massachusetts, is strategically situated.

Trailer camps are planned for all Kentucky parks. These will be available when the parks are officially opened. Camps are available at present at Levi Jackson Wilderness Road State Park, London; Dawson Springs State Park, Dawson Springs; Cumberland Falls State Park, Corbin; and Butler Memorial State Park, Carrollton.

One trailer development is actually under way in Ohio, although others are contemplated. The CCC is preparing a forty-acre wooded tract for the exclusive use of trailer travelers in Taylorsville Park, Vandalia.

Only one trailer camp is definitely planned to be established in West Virginia by the CCC. This will be prepared in Watoga State Park. In another year an additional trailer area may be established in Tomlinson Run State Park.

New Hampshire has partly developed accommodations at Moose Brook State Park, Gorham. Facilities are in use in High Point State Park, Sussex, New Jersey.

In addition to Selkirk Shores State Park facilities, New York State has a camp in use at Green Lakes State Park, near Syracuse. Facilities are being developed at Grass Point and Cedar Point State Parks, Thousand Islands Region.

Accommodations are planned at Morrow Mountain State Park, Albemarle, and Hanging Rock State Park, Danbury, in North Carolina. Burlingame State Reservation, near Westerly, Rhode Island, has partly developed trailer accommodations. In South Carolina, preliminary plans have been approved for Poinsett State Park, Wedgefield, and development is under way at Myrtle Beach State Park, Myrtle Beach.

Pakagon State Park, Indiana, has a forty-site general camp area with a limited number of "pull-in" parking sites for trailers. Indiana Dunes State Park offers a 150-site general camping area with a limited number of "pull-in" sites for trailers. Similar facilities are provided in the forty-site general camping area at Turkey Run State Park.

Michigan offers trailer camping facilities in four state park areas. In Ludington State Park there are thirty trailer sites in an area designed to accommodate fifty campers. Twenty tent or trailer campers may be accommodated on a camp ground in Wilderness State Park, Carp Lake. Two hundred and fifty campsites in two areas, which will handle fifty trailers, have been provided in Muskegon State Park. In Otsego State Park, Otsego Lake, an excellent camp area has been provided, with 135 campsites for trailers or tent campers.

In Wisconsin, Copper Falls State Park offers twenty-two trailer sites. In Devil's Lake State Park there are fifty trailer sites under development.

Sites for 100 trailers have been established in Itasca State Park, Minnesota. Scenic State Park and Gooseberry Falls State Park in the same state offer twenty and thirty sites, respectively. Trailer sites are under construction at Sibley, Whitewater, and Jay Cooke State Parks.

ASK THE FORESTER

Forestry Questions Submitted to The American Forestry Association, 919 - 17th St., N. W., Washington, D. C., will be Answered in this Column. . . . A Self-Addressed Stamped Envelope Should Accompany Your Letter.

QUESTION: Can the native wild blueberry be encouraged through cultivation to produce more abundant crops?—E. L., Vermont.

ANSWER: In New England growers improve the size of the fruits and the yield of the bushes by removing weeds and practicing proper pruning. Pruning is done in early spring before growth starts. The oldest third of the wood is removed, making the cut as near the base of the plant as possible. All weeds are cut close to the ground, and all brush removed from the plot. Some growers have successfully propagated plants from some of the better wild plants and filled out the plantation with them. Burning is discouraged.

QUESTION: Do you have any evidence that the reading public has a growing interest in conservation? If so, what is the evidence? —E. L. P., New York.

ANSWER: On the basis of continued contact with conservation interests throughout the country, this office finds unlimited evidence that the reading public has become increasingly interested in conservation during the past few years. Not only is this shown in local, regional, and national activities, but in the number of conservation articles and news items which are carried in the daily press and in magazines. Such articles are of sufficient volume so that The American Forestry Association has recently started a bi-monthly readers' digest of conservation articles selected from various magazines and known as "CONSERVATION." Ten years ago the dearth of articles on conservation in popular magazines would have made such an effort impossible.

QUESTION: Can you give the names of some of the companies which are manufacturing paper and pulp in the South?—J. B. G., South Carolina.

ANSWER: The following list of some of the companies who have recently built mills in the South and are in operation or will be in the near future was furnished by the American Paper and Pulp Association: Crossett Paper Mills Company, Crossett, Arkansas; West Virginia Pulp and Paper Company, Charleston, South Carolina; Southern Kraft Corporation, Georgetown, South Carolina; Chesapeake-Camp Corporation, Franklin, Virginia; Port St. Joe Paper Company, Port St. Joe, Florida; Brunswick Pulp and Paper Company, Brunswick, Georgia; Kieckhefer Container Corporation, Plymouth, North Carolina; Kraft Corporation of America, Fernandina, Florida; Union Bag and Paper Company, Savannah, Georgia; Southland Corporation, Texas (site not selected as yet); Champion Fibre Company, Houston, Texas, and the Commercial Pulp and Paper Company, Orange, Texas.

Other mills manufacturing paper and pulp in the South are listed in Lockwood's Directory of the Paper and Allied Trades.

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JULY 18 to 31 Through the primitive Bridger Wilderness, the Wind River Mountains of Wyoming. Wyoming National Forest —a land of wild flowers, glaciers and mountain grandeur.

SAWTOOTH Expedition . . .
AUG. 4 to 17 Up into the wild rugged Sawtooth Mountains north of Sun Valley in the Boise National Forest—unexplored regions unspoiled by civilization. No better trout fishing anywhere.

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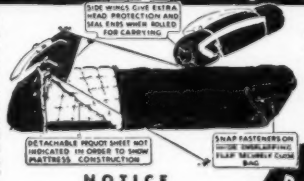
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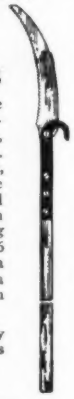

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CONSERVATION CALENDAR

Important bills in Congress with action from April 23 to May 13

BILLS ENACTED

H. J. Res. 319 — WOODRUM — Making $1,000,000 immediately available for the control of incipient or emergency outbreaks of insect pests or plant diseases, etc., in accordance with Public Resolution No. 20. Approved April 27, 1937. Public Resolution No. 26.

H. R. 4728—DOXEY (S. 1504—NORRIS)—To authorize cooperation in the development of farm forestry in the States and Territories, and for other purposes. Passed House May 5, 1937. Passed Senate May 6, 1937. Signed by the Speaker May 10, 1937.

H. R. 3306—STUBBS—To authorize a preliminary examination and survey of Santa Maria River with a view to the control of its floods. Passed House March 1, 1937. Passed Senate April 12, 1937. Presented to the President for approval and signature May 10, 1937.

APPROPRIATIONS

H. R. 5779 — MCMILLAN — Making appropriations for the Department of State, Justice, Commerce, and for the judiciary. Sent to conference April 23, 1937.

H. R. 6523—CANNON—Making appropriations for the Department of Agriculture and for the Farm Credit Administration for the fiscal year ending June 30, 1938. Introduced and reported (Report No. 625) April 20, 1937. Passed House April 23, 1937. Passed Senate amended May 13, 1937.

H. R. 6958—TAYLOR—Making appropriations for the Department of the Interior for the fiscal year ending June 30, 1938. Introduced and reported (Report No. 786) May 11, 1937. Under consideration May 13, 14, 1937.

EDUCATION

S. 1052—BANKHEAD—To provide for the further development of cooperative agricultural extension work. Reported without amendment (Report No. 353) April 19, 1937. Passed Senate May 3, 1937.

GOVERNMENTAL FUNCTIONS

H. R. 6351—CONNERY—To establish a Civilian Conservation Corps, and for other purposes. April 21, 1937. Referred to the Committee on Labor. Reported without amendment (Report No. 687) April 23, 1937. Passed House May 12, 1937.

LANDS

H. R. 5858—DEROUEN—Relating to the revested Oregon and California Railroad and reconveyed Coos Bay Wagon Road Grant lands situated in Oregon. Public hearings by Committee on Public Lands resumed May 11, 1937.

NATIONAL PARKS

H. R. 5394 — MCGROARTY (S. 1791 — MCADOO)—To provide for the acquisition of certain lands for, and the addition thereof, to the Yosemite National Park in California. Reported with amendment (Report No. 745) April 30, 1937, by the Committee on Public Lands.

H. R. 6599 — BREWSTER (H. R. 5864 — BREWSTER)—To provide for the Katahdin National Park in Maine. April 22, 1937. Referred to the Committee on Public Lands.

WATER AND STREAM CONTROL

S. 534 — WHEELER — Granting consent to Montana and Wyoming to negotiate and enter into a compact for division of the waters of the Yellowstone River. Passed Senate February 10, 1937. Reported without amendment (Report No. 627) by the House Committee on Irrigation and Reclamation, April 20, 1937.

H. J. Res. 175—MCCLELLAN (S. J. Res. 57 —SEN. CARAWAY)—To authorize the submission to Congress of a comprehensive national plan for the prevention and control of floods of all the major rivers of the United States, etc. January 29, 1937. Reported with amendment (Report No. 798) by Committee on Flood Control May 11, 1937.

H. R. 5828—MARTIN, Colorado—To provide a preliminary examination of the Fountaine Qui Bouille (Fountain) River and its tributaries in Colorado with a view to the control of their floods and the conservation of their waters. March 22, 1937. Reported with amendment (Report No. 614) by the Committee on Flood Control April 14, 1937. Passed House May 3, 1937.

WILDLIFE

H. R. 6740—KLEBERG—To amend Section 13 of the Migratory Bird Conservation Act of February 18, 1929. April 28, 1937. Referred to the Committee on Agriculture.

CONGRATULATING GENERAL APPLETON

On June 17, 1937, The American Forestry Association will salute its oldest living president—General Francis Henry Appleton, of Boston, for on that day General Appleton is celebrating his 90th birthday.

Born at Boston, Massachusetts, in 1847, General Appleton took his master's degree at Harvard in 1869. His military service dated from 1870, when he became a member of the First Corps Cadets, an organization incorporated in Massachusetts in 1741. He went right up the line to captain and staff commander-in-chief and finally retired on January 3, 1900, with the rank of major-general. Having early devoted himself to the study of agriculture, he did special work at Harvard and practiced extensive farming on his estates at Peabody.

Gen. Francis Henry Appleton

A prominent Republican, he represented Peabody in the State Legislature in 1892 and later was trustee and president of Peabody Institute and of the New England Agricultural Society. He was elected to the Presidency of The American Forestry Association in 1897.

A "look at the record" of the activities of the Association during the days of General Appleton's administration is of interest. It is seen, even then, girded for war and in the vanguard of the conservation forces, battling for national legislation for the protection and administration of the then public Forest Reservations, later to become the National Forests; cooperating through active campaigns in the several states in the acquirement and establishment of State forest reservations, and in their efforts for proper forest fire control; urging upon State and Federal authorities measures to encourage the study of forestry in all agricultural colleges and other centers of higher education, and collaborating with the National Academy of Sciences—the legally constituted advisor of the government in scientific fields—in securing from Congress an appropriation of $25,000 to finance the Forestry Committee of the Academy in an inspection of the public timberlands as a basis for desired legislation.

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Manual of Trees of North America—Sargent	$ 5.00
Trees of Northern States and Canada—Hough	6.00
Trees of Southeastern States—Coker and Totten	2.00
Pacific Coast Trees—McMinn and Maino	3.50
Trees of North America—The Conifers—Green	2.00
Trees of North America—The Broadleafs—Green	3.50
Northern Rocky Mountain Trees—Kirkwood	2.50
American Trees and Shrubs—Mathews	3.50
Tree Book—Rogers	5.00
Our Native Trees—Keeler	3.00
Trees in Winter—Blakeslee and Jarvis	2.00
Tree Ancestors—Berry	3.00
Tree Flowers of Forest, Park, and Street—Rogers	7.50
Some American Trees—Werthner	5.00
The Redwoods of Coast and Sierra—Shirley	1.25
Identification of Trees and Shrubs—Makins	4.00
Evergreens—Hill	3.50

GENERAL FORESTRY

General Forestry—Brown	$ 3.25
An Outline of General Forestry—Illick	1.50
Forest Education—Graves and Guise	2.50
Profession of Forestry—Read	1.25
Forest Physiography—Bowman	5.00
Forest Law in America—Kinney	2.25

FOREST MANAGEMENT

Forest Management—Recknagel, et al	$ 3.50
Theory and Practice of Silviculture—Baker	5.00
Practice of Silviculture—Hawley	4.00
Manual of Forestry—Hawley and Hawes	3.50
Forest Management—Chapman	3.50
Management of American Forests—Mathews	5.00
Applied Silviculture in the U. S. A.—Westveld	4.00
Forestry in New England—Hawley and Hawes	3.50
Farm Forestry—Ferguson	2.00

MENSURATION AND VALUATION

Manual for Northern Woodsmen—Cary	$ 3.00
Forest Mensuration—Chapman and Demerritt	3.50
Forest Mensuration—Bruce and Schumaker	3.50
Forest Finance—Chapman	3.50

WOOD—ITS MANUFACTURE AND USE

American Lumber Industry—Brown	$ 3.00
Forest Products—Brown	4.00
Lumber, Its Manufacture and Distribution—Bryant	4.50
Logging Principles and Practices—Brown	3.50
Logging—Bryant	4.50
Logging Transportation—Brown	4.00
Lumber and Its Uses—Kellogg	4.00
Identification of Economic Woods—Record	2.50
Mechanical Properties of Wood—Garrett	3.50
Identification of Timbers—Brown and Panshin	3.00
The Properties and Uses of Wood—Koehler	3.50

PLANTING OF TREES AND FORESTS

Seeding and Planting—Toumey and Korstian	$ 5.00
Cultivated Conifers—Bailey	7.50
Roadsides—Bennett	3.00

FOREST PESTS

Principles of Forest Entomology—Graham	$ 3.50
Outline of Forest Pathology—Hubert	6.00
Insects and Diseases—Felt and Rankin	5.00
Diseases of Cultivated Trees and Plants—Massee	4.00
Forest Insects—Doane, et al	4.50
Our Enemy, the Termite—Snyder	3.00
Biological Control of Insects—Sweetman	3.75

NATIONAL FORESTS

History of Forest Service—Smith	$ 3.00
Our National Forests—Boerker	2.50

NATIONAL PARKS

Book of the National Parks—Yard	$ 3.00
Grand Canyon Country—Tillotson and Taylor	2.00
Let's Go to the Park—Morrison and Huff	3.00
One Hundred Years in Yosemite—Russell	3.50
Trees of Yosemite—Tresidder	2.00
Animal Life in Yellowstone—Bailey	4.00
High Trails of Glacier National Park—Thompson	3.00

CAMPING AND RECREATION

Camp Cookery—Kephart	$ 2.50
Camping and Woodcraft—Kephart	2.50
Campers' Handbook—Wallace	2.00
Handbook for Rangers and Woodsmen—Taylor	3.00
The Real Log Cabin—Aldrich	2.50

BIRDS, WILDLIFE, FISHING AND HUNTING

Handbook of Birds of North America—Chapman	$ 5.00
Birds of the Pacific Coast—Eliot	3.50
Bobwhite Quail—Stoddard	6.00
Game Management—Leopold	5.00
Western Bird Guide—Reed	1.75
Field Book of Wild Birds—Mathews	3.50
American Waterfowl—Phillips and Lincoln	4.50
Bird Portraits in Color—Roberts	3.50
American Fishes—Goode	6.00
Taking Trout with a Dry Fly—Camp	2.00
The Modern Angler—Knight	2.75
The Reptiles of North America—Ditmars	6.75

FLOWERS AND GARDENING

American Wild Flowers—Mathews	$ 3.50
Wild Flowers—House	3.95
Field Book of Western Wild Flowers—Armstrong	3.50
Western Flower Guide—Saunders	3.50
Hardy Californians—Rowntree	3.50
Ferns of Northeastern United States—Wiley	1.00
Field Book of Common Ferns—Durand	2.50
The Mushroom Handbook—Krieger	3.50
Field Book of Illinois Wild Flowers	1.50
Spring Flowers of Minnesota—Rosendahl	1.00

MISCELLANEOUS

Our Natural Resources—Parkins and Others	$ 5.00
Conservation—Havemeyer and Van Hise	5.50
Our Federal Lands—Yard	3.00
Green Laurels—Peattie	3.75
Through the Woods—Bates	3.00
Audubon—Rourke	3.00

This list of Selected Books is a service of The American Forestry Association to its members. Prices quoted are not guaranteed, but to the best of our knowledge are correct. A more complete list of recommended books is available on request. Members ordering books through the Association are entitled to a 10% discount from published prices.

NEW BOOKS

GREEN LAURELS, by Donald Culross Peattie. Published by Simon and Schuster, New York. 368 pages. Ills. Price, $3.75.

Daring, adventurous men with painstaking, methodical capacity for keeping records have left their imprint on the accepted names of flowers, trees, birds, and animals. They wielded a considerable influence upon their times, and were pioneers in the truest sense of the word.

What botanist or person even casually interested in botany has not wondered what sort of men they were? Linnaeus and Audubon are known to many in a superficial way, but what about the others who have contributed much to our knowledge of living things?

In "Green Laurels," Donald Culross Peattie has not attempted to describe more than a few of the true pioneers. It is notable, however, for the sympathetic picture of some of the world's scientific men as seen in the light of their times and surroundings.—G. H. C.

THE MODERN ANGLER, by John Alden Knight. Published by Charles Scribner's Sons, New York, N. Y. 260 pages; illustrated. Price, $2.75.

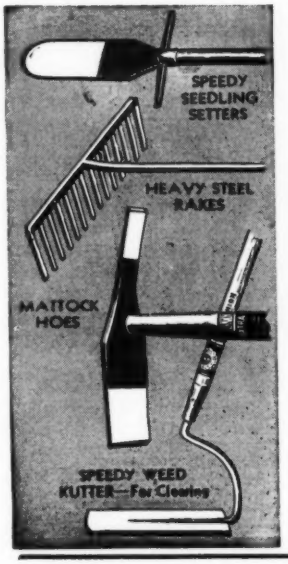
Mr. Knight, a fisherman of many years' experience, has written here a book of absorbing interest to the fresh-water angler, whether novice or expert. There have of recent years been a number of new developments in methods or equipment and these have been covered with great care.

More important, however, is the section of the book devoted to the Solunar Theory, developed by the author. This in itself is fascinating. In fact, the whole book is fascinating in that it promises better things to those followers of the rod and reel.—E. K.

THE GREAT SMOKY MOUNTAINS, by Laura Thornborough. Published by Thomas Y. Crowell Company, New York City. 147 pages, illus. Price $2.00.

One concurs with the description of this book as "a friendly guide to the newest of America's national wonderlands—written from the inside," for the author knows and loves the Great Smokies with an intense love, as only one born and brought up among them could. Laura Thornborough intimately knew this magnificent high country long before it attracted national attention and had the distinction of being set apart as an eastern National Park. She had explored, with knapsack and camera, the lofty summits, had ridden horseback and tramped through its gracious valleys and discovered many sweet, hidden trails. The lovely waterfalls, the bird and plant life, the singing brooks were old familiars to her, and now she has written of them in simple, fluent style. Included are many fascinating accounts of the mountain people, and she brings out their distinctive customs and age-old "yarb" lore —heritage of a simple, dignified people, living for generations far from the touch of the world. The special illustrations feature a book we predict will have a wide reading. From the fact that before the Park was officially opened—in 1936—over half a million visitors entered its gates, it is reasonable to expect a heavy influx of travel this year and to these thousands, eagerly planning to explore the Great Smokies by car and afoot, the first-hand information to be found in this book will be a great boon.—L. M. C.

Special Purpose TOOLS for Foresters



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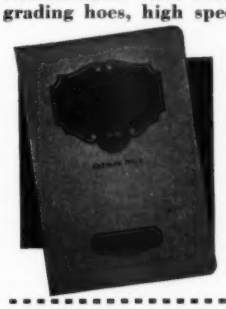

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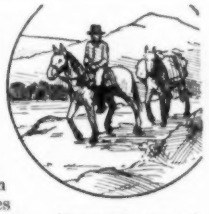

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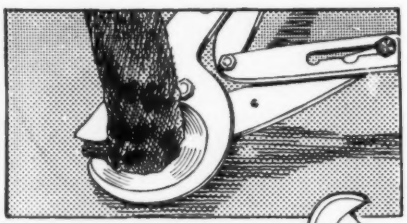

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HOW FORESTS RETARD FLOODS

(*Continued from page* 277)

as long to sink into soil in the open as in the forest, and about thirty times as long if the soil had been compacted by grazing. The rotten wood and litter of the forest floor, as well as the decaying vegetation, often known as the duff, absorbs and holds tenaciously enormous quantities of water. In the open such vegetable remains are quickly consumed and blown or washed away. This mantle of non-conducting organic matter protects the mineral soil from freezing as deeply in the forest,—only sixty per cent as deep as in the open—and thus makes possible percolation of water deep into the soil when bare soils are strongly frost-bound. Furthermore freezing in the forest is delayed one month over that in the open.

Trees themselves use huge quantities of water during their growing season. Measurements of transpiration show that astonishing quantities of water are absorbed by tree roots, taken up by the sap stream and evaporated from the leaves. With certain types of forest, this may equal the summer rainfall. Considerable water, too, is used by the trees in growth. More than half of wood substance, chiefly cellulose, is water, and during the season when trees are not in leaf their trunks are often filled with absorbed water. Deciduous forests use ten or more times as much water as evergreen conifers, but both in the vegetative season quickly reduce the soil moisture, thereby tending to keep the forest floor always ready for the sinking in of a goodly percentage of any water which penetrates the leaf canopy.

It is a matter of common observation that in the shade and relative calm of a forest the winter's snow cover lasts days or weeks after it has disappeared in the open. In the densest forests, interception will prevent so much snow from reaching the ground that there will not be so much snow to melt as in ordinary forests. On the other hand, there is not so much sunshine or wind to melt it. But since it is common observation that the snow stays longer on the ground in the forest than in the open it is obvious that the effect of interception in reducing the catch is not so great as the effect of the foliage in reducing the rate of melting.

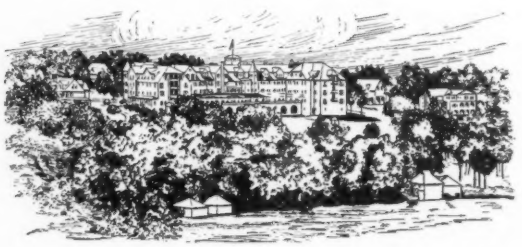
Here is where the influence of forests on winter and spring floods in cold regions is most important and far-reaching. Based on observations during the snow melting of the great flood period of March, 1936, it appears that during a warm windy rainstorm sixty-five per cent of the snow in the open will be melted by the wind, the contributions of conduction of heat from the air and latent heat from condensation on the snow surface being about equal; twenty-five per cent of the snow will be melted by the insolation, and ten per cent by the warmth of the rain. These are very rough figures, but they may be relied on for the general order of magnitude of the different factors.

Now, numerous observations prove that wind movement is twice to nine times as great in the open as in the forest and least in the densest all-aged forest. In a dense evergreen forest, the melting will be about one-fifth as much from wind, one-third as much from insolation and three-quarters as much from rain, making the wind effect about forty-five per cent of the total, the insolation thirty per cent, and the rain twenty-five per cent. While a whole layer of twenty-four inches might melt in the open, only seven inches or forty per cent of the eighteen inches—after interception of six—in the forest would melt.

The remnant of snow cover in the forest is of utmost importance in flood prevention during great rainstorms, such as occurred in the northeastern United States in March, 1936. Even a dense springtime snow cover is half to three-quarters air. So a foot of snow in the woods can absorb six to nine inches of rainfall, or, we should say, the six to nine inch unintercepted remnant of an eight to twelve inch rainfall. On a slope, all this water would not stay put, of course; nevertheless, it would take time for it to work its way to channels and into the streams. The snow cover would in this way augment the damming action of the innumerable leaves, twigs, branches, and logs on the forest floor.

When one considers the thousands of gallons thus held in restraint on one acre, and the thousands of acres over which this condition prevailed, it will be realized that here was one of the most striking demonstrations of protection by the forest. Everyone could see that after the flood snow still lay knee deep in the forests, while the surrounding open hills were bare; and if any one took the trouble to melt a sample of this dense snow, there was to be found Jupiter Pluvius himself, trapped and imprisoned!

In addition to intercepting, absorbing, and holding water in different ways, the forest also profoundly affects the rate and manner in which it runs off the surface to streams, or filters slowly underground. More water sinks deeply into the soil in the for-



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est because even mineral soil accumulates to a greater depth in the forest. Even though this deep-seeping water emerges along the streams later, the delay is such that the main crest of a flood will have passed long before the main body of this water comes to sight again. In fact, it is the slowness of movement of the ground water which maintains a considerable flow of streams in a forested region for weeks and even months after the water has sunk into the ground. The water which passes off over the surface is of chief importance in floods. Here again the litter on the ground in dense forests obstructs and delays its passage; the snow, if any is present, does the same.

Above all, dense tree growth is the best protection against erosion. Eroded lands have been found to have far greater and more rapid runoff in experiments conducted by the Soil Conservation Service. A few figures may illustrate:

Cover on Watershed	*Erosion* Tons of soil removed per acre by the water in a year	*Runoff* Per cent of rain
North Carolina		
Fallow land	64.6	29.6
Cotton land	22.6	10.2
Grass land	0.012	0.34
Forest (litter burned)	0.63	3.6
Forest (virgin unburned)	0.0021	0.12
Tyler, Texas		
Fallow	10.3	17.2
Cotton	19.1	19.5
Grass	0.18	1.3
Forest (litter burned)	0.19	2.7
Forest (unburned)	0.083	0.7

This shows the extreme importance of preventing forest fires. Other studies in Idaho showed that the water-holding capacity of an eroded soil was 44 per cent and the same soil uneroded nearly 81 per cent or nearly twice as much. It is significant that where much erosion is in progress dams intended to control floods, quickly fill with silt, and even river bottoms build up, requiring constantly higher and higher levees. Runoff is influenced by many factors, such as the character of precipitation, geology and soils, topography—especially the degree of slope, and the character of surface and vegetative cover. The last is the only factor which it is within human power to control, and the easiest way to control runoff is by forest management.

It must not be assumed that forests are always conservors of water. The huge drain on the soil from summer transpiration may even diminish total stream flow. Species of trees with low water requirements are therefore chosen for planting around reservoirs. Furthermore it is even possible to cite certain combinations of meteorological and surface conditions in which forests could augment floods. For example, the quick runoff from a sharp, heavy rain may come off a cultivated slope into streams flowing full from a forested watershed following a heavy rain some time previously or during the spring freshet from delayed snow melting. This might cause more of a flood momentarily than if the stream bed had been dry—but a greater flood would doubtless occur without any forest at all; so perhaps a flood due to partial forestation should be charged not to upstream forests, but rather to the downstream open country.

Again, it is difficult to show that flood stages are correlated with the varying amounts of forest area on the watersheds. The Ohio basin has perhaps one-third as much area in forest as formerly, but on the other hand some New England streams have double as much forested watershed as fifty to seventy-five years ago, and still floods continue. The difficulty is that the conditions leading to every flood are often dissimilar from previous cases, and tend to obscure the influence of the forest. Second-growth and sprout land is also much less effective than a smaller area of old all-aged mixed coniferous forest.

Flood control is a complicated problem at best. Just as excessive grazing and clean cultivation have intensified the always existing dust storms and floods in the West, removal of forests, and conversion of dense all-aged high coniferous forest to low second-growth hardwood in much of the East, combined with recurrent forest fires has increased the runoff during floods. No policy of flood control can neglect to take into account the effect of forests in reducing the amount of water, in the form of rain or snow, that reaches the ground, in reducing the rate of release of water from melting snow, in promoting infiltration, and in obstructing the rate of runoff and conserving soil.

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SASSAFRAS VOYAGE

(*Continued from page* 285)

from the Cartier account, which he went to great pains to obtain. He may have read the Frampton translation of Monardes. He noted with interest that sassafras was mentioned in the Raleigh voyages of 1584 and 1585. Among his French sailor friends came one with "a piece of the tree called Sassafras, brought from Florida, and expounds its high medicinal virtue."

In 1602 "Samuel Mace of Weimouth, a very sufficient Mariner," was sent out by Sir Walter Raleigh. "From that place where they abode, they brought Sassafras . . . with divers other commodities."

In that same year went out Bartholomew Gosnold, who discovered and named Cape Cod on the New England coast. He brought back "Sassafras trees, the roots whereof at three shillings the pound are three hundred thirty sixe pound (sterling) the tunne." But, said Gosnold in a letter to his father, the amount they brought back was small, "the rather because we were informed before our going forth, that a tunne was sufficient to cloy England."

But the sassafras market was not glutted. The "soveraine remedie" was at the height of its popularity. The next year the "sassafras voyage" began. It is, apparently, the only expedition ever launched for the sole purpose of obtaining sassafras. That Master Hakluyt had no small part therein may be seen from the account of the voyage made "in the yeere 1603, under the command of one Martin Pringe:

"Upon many probable and reasonable inducements, used unto sundry of the chiefest Merchants of Bristoll, by Master Richard Hakluyt Prebendary of Saint Augustines the Cathedrall Church of the said Citie, after divers meetings and due consultation they resolved to set forth a Voyage for the farther Discoverie of the North part of Virginia. And first they sent the said Master Hakluyt accompanied with one Master John Angell, and Master Robert Saltern (which had beene in the said Discoverie the yeere before with Captaine Bartholomew Gosnold) to obtain permission of Sir Walter Raleigh (which had a most ample Patent of all those parts from Queene Elizabeth) to entermeddle and deale in that action. Leave being obtained of him under his hand and Seale, they speedily prepared a small ship called the Speed-well in burthen about fiftie tunnes, manning the same with some thirtie men and Boyes, wherein went for Master and chiefe Commander in the Voyage one Martin Pringe, a man very sufficient for his place, and Edmund Jones his Mate, and Robert Salterne above mentioned, as their chiefe Agent, with a Barke called the Discoverer, of six and twentie tunnes or thereabout. . . .

"The aforesaid ship and Barke were plentifully victualled for eight monethes, and furnished with slight Merchandizes thought fit to trade with the people of the Countrey, as Hats of divers colours, greene, blue and yellow, apparell of coarse Kersie and Canvasse readie made, Stockings and Shooes, Sawes, Pick-axes, Spades and Shovels, Axes, Hatchets, Hookes, Knives, Sizzers, Hammers, Nailes, Chissels, Fishhookes, Bels, Beades, Bugles, Lookingglasses, Thimbles, Pinnes, Needles, Threed, and such like. They set saile from Kingrode the twentieth day of March. . . ."

On a day in June they fell in with the "Mayne in the latitude of 43. degrees and an halfe," in the vicinity of Old Orchard, Maine. "But meeting with no Sassafras, we left those places . . . shaping our course for Savage Rocke, discovered the yeere before by Captaine Gosnold, where going upon the Mayne we found people, with whom we had no long conversation, because here also we could find no Sassafras. . . .

"Not yet satisfied in our expectation, we left them and sailed over, and came to an Anchor on the South side in the latitude of 41. degrees and odde minutes," somewhere along the present coast of Connecticut, if their reckoning was correct. "Here we had sufficient quantitie of Sassafras."

The Indians visited them. "We had a youth in our company that could play upon a Gitterne, in whose homely Musicke they tooke great delight, and would give him many things, as Tobacco, Tobacco-pipes, Snakes skinnes of six feet long, which they use for Girdles, Fawnes skinnes, and such like, and danced twentie in a Ring, and the Gitterne in the middest of them, using many Savage gestures, singing. . . .

"We carried with us from Bristoll two excellent Mastives, of whom the Indians were more afraid, than of twentie of our men. One of these Mastives would carrie a halfe Pike in his mouth. And one Master Thomas Bridges a Gentleman of our company accompanied only with one of these Dogs, and passed six miles alone in the Countrey having lost his fellowes, and returned safely. And when we would be rid of the Savages company wee would let loose the Mastives, and suddenly with outcryes they would flee away. . . .

"Having spent three Weekes upon the Coast before we came to this place where we meant to stay & take in our lading, according to our instructions given us in charge before our setting forth, we pared and digged up the Earth with shovels, and sowed Wheate, Barley, Oates, Pease, and sundry sorts of Garden Seeds. . . .

"By the end of July we had laded our small Barke called the Discoverer, with as much Sassafras as we thought sufficient, and sent her home into England before, to give some speedie contentment to the Adventurers. . . .

"After their departure we so bestirred our selves, that our shippe also had gotten in her lading, during which time there fell out this accident. On a day about noone tide while our men which used to cut downe Sassafras in the Woods were asleepe, as they used to doe for two hours in the heat of the day, there came downe about seven score Savages armed with their Bowes and Arrowes, and environed our House or Barricado, wherein were foure of our men alone with their Muskets to keep Centinell, whom they sought to have come downe unto them, which they utterly refused, and stood upon their guard. Our Master likewise being very carefull and circumspect having not past two with him in the shippe put the same in the best defence he could, lest they should have invaded the same, and caused a piece of great Ordnance to bee shot off, to give terrour to the Indians, and warning to our men, which were fast asleepe in the Woods: at the noyse of which Peece they were a

little awaked, and beganne a little to call for Foole and Gallant, their great and fearefull Mastives, and full quietly laid themselves downe againe, but being quickned up eftsoones againe with a second shot they rowsed up themselves, betooke them to their weapons and with their Mastives, great Foole with an halfe Pike in his mouth drew downe to their ship: whom when the Indians beheld afarre off, with the Mastive which they most feared, in dissembling manner they turned all to a jest and sport, and departed away in friendly manner: yet not long after, even the day before our departure, they set fire on the Woods where wee wrought, which wee did behold to burn for a mile space, and the very same day that wee weighed Anchor, they came downe to the shoare in greater number, to wit, very neere two hundred by our estimation, and some of them came in their Boates to our ship, and would have had us come in againe; but we sent them backe, and would none of their entertainement. . . .

"We also observed that we could find no Sassafras but in sandie ground. In our returne we brought our selves into the latitude of eight and thirtie degrees about the Acores for certain causes, and within five weekes space came from our Port of Virginia, into the soundings of England, but there being long encountered Easterly winds, we came at length into Kingrode, the second of October 1603."

The French, meantime, were interested in finding the source of sassafras located by Cartier. Writing of the winter of 1608-09, as translated by Hakluyt, Monsieur de Monts said: "Monsieur Champlain, who is now in the great River of Canada, passing his Winter, in the same part, where the said Quartier did winter, hath charge to finde it out, and to make provision thereof."

He was disappointed: "The said Champlein made diligent search for the same, and could have no newes thereof."

TREE HONORS MOTHERS OF MARYLAND GOVERNORS

The Colonel Tench Tilghman Chapter, Daughters of the American Revolution, on May 9, planted a white birch—the "Mothers Tree," in the grounds of the Government House, at Annapolis, to honor the mothers of the governors of Maryland. Governor Harry W. Nice accepted the tree for the State. Mrs. Eva C. Chase, Chairman of Conservation for the Chapter, was in charge of the dedication.

And so into times approaching the present, as we see from Hare's "National Standard Dispensary":

"The distillation of sassafras oil is an American industry. The principal States producing the oil are Virginia, Maryland, and Pennsylvania. During and after the Civil War (1861-65) considerable oil was also distilled in New Jersey, New York, Ohio, Indiana, Tennessee, and the New England states, until the practical extinction of the tree rendered the industry unprofitable."

What, then, does modern science think of the medicinal properties of sassafras? Cushny's "Pharmacology" gives this estimate: "The virtues of these old-fashioned remedies lie perhaps more in the large draughts of warm water than in the traces of volatile oil which they contain, but the presence of the latter prevents, to some extent, the nausea produced by warm water alone."

Hare, however, finds a value in oil from the bark of the sassafras root. It is, he says, "used chiefly as a flavoring agent to mask the taste of less agreeable drugs. An infusion of 1 fluid ounce to 1 pint is used as a popular household remedy for diuretic and diaphoretic effect in febrile states. . . . Sassafras pith, made into mucilage, is employed as a demulcent in dysentery and inflammations of the air-passages and stomach. The mucilage forms an agreeable and efficient collyrium in acute conjunctivitis, and serves as a vehicle for more active remedies."

To such a sad end—"collyrium in acute conjunctivitis"—comes what was once a "soveraine remedie"!

But go into a hill-country town, wander through the farmer's market, and you can buy sassafras in season, a bundle for a nickel. And if, visiting the hill-folk in early spring, you get that run-down feeling, like as not the remedy is promptly produced. Your winter-thickened blood needs medicine: Here's a cup of sassafras tea to thin it out.

REPORT OF ANNUAL MEETING

The Sixty-second Annual Meeting of The American Forestry Association, to be held jointly with The Ohio Forestry Association at Cincinnati, Ohio, May 31, June 1, 2 and 3, will be fully covered in the July issue of AMERICAN FORESTS. Undoubtedly you will want extra copies to send to your friends and, as the print order will be limited, you are urged to place your order at once.

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SANCTUARY

(*Continued from page 292*)

refuge includes next the White River Migratory Waterfowl Refuge—110,000 acres in the midst of the greatest waterfowl concentration in the Mississippi Valley Flyway. Ducks winging their way to winter quarters from breeding grounds over a region stretching from eastern Montana to western Ohio and far into the north, gravitate to the main valley of the Mississippi; and all the flight lanes converge at the White River bottle-neck.

There are so many birds here, in fact, that one of the problems facing the refuge superintendent during rainy harvest seasons is how to keep the ducks and geese at home nights and out of the neighbors' rice fields. He is trying to solve it by propagating more natural duck foods on the refuge and setting a better table there than the birds can find elsewhere. What the damage of the Mississippi floods this year may be cannot be estimated now, but the question suggests another problem in water control on the White River area.

Two stops in Louisiana will provide a further understanding of the work the Federal Government is doing to provide for the wintering needs of the wild birds. The Sabine Migratory Waterfowl Refuge in Cameron Parish, bounded by two lakes and the Gulf of Mexico, includes more than 137,000 acres where hundreds of thousands of birds winter annually, ducks of practically every species, four species of geese, thirty-eight species of shorebirds. Purchased by the Government from a company that has developed what is probably the largest muskrat farm in existence, the right to take muskrats for a period of ten years is being retained by the former owners, but this will not detract from the value of the area as a wintering place for waterfowl. As one sports writer who has hunted ducks from Alaska to Brazil said enthusiastically: "Here is the winter Palm Beach, the loafing place of waterfowl that breed east of the Rocky Mountains, and they congregate on the low-lying marshlands by the million."

The other Louisiana area, the Delta Refuge at the mouth of the Mississippi in the eastern boot-tip of the State, remote and almost inaccessible, provides another rare opportunity to see innumerable birds in unspoiled, natural marshes. Last winter it was estimated that this refuge at the terminus of the greatest of the continental flyways, provided for the needs of 750,000 birds, of which about 500,000 were ducks and geese, the remainder curlews, plovers, cormorants, coots, ibises, royal and Caspian terns.

From Louisiana, our journey takes us to the marvelous swamp that constitutes the 300,000-acre Okefenokee Wildlife Refuge in southeastern Georgia. Here, it is reported, the rare ivory-billed woodpecker still drums on the cypress trees in a wilderness inhabited by the panther, the black bear, the eagle, and the limpkin. This swamp probably has no counterpart anywhere, and "status quo" is the Biological Survey's program for it. The beautiful wood duck is a year-round inhabitant here. In all there are eleven species of ducks, including ring-necks, pin tails and black ducks.

William Bartram more than a century and a half ago heard the Creek Indians describe the Ouquaphenogaw, as he spelled it, as "a most blissful spot on earth." It was inhabited, they said, by "a peculiar race of Indians, whose women are incomparably beautiful."

There are still things of beauty in Okefenokee. The refuge is to be maintained as a rare attraction to wildlife enthusiasts and—most important of all—to the wildlife itself.

One more refuge remains on this itinerary—the Lake Mattamuskeet Migratory Waterfowl Refuge, in North Carolina. Its history is another story of how man with his drainage implements spoiled the habitat of wild creatures and did himself no good. Perhaps in this instance the bitter irony of events is more pointed than anywhere else, for after playing havoc with a wonderful wildfowl area, the drainers put up a bronze monument to themselves.

The monument was still standing to greet the Biological Survey men when they came to Mattamuskeet to restore the area to its original usefulness. And this is what it said: "This plant is dedicated to the spirit of co-operation which has here transformed a great lake into dry land and so created a new and fertile principality for the use and possession of man." But the new and fertile principality turned out to be an illusory hope. The Survey has transformed it back into a great lake—a principality for wildlife. Here last winter it was estimated that there were more than 13,000 geese, 11,000 ducks, and 4,000 swans.

Mattamuskeet is the end of this armchair tour of a baker's dozen of Uncle Sam's stopping places for wild birds. It is only a short distance, however, to the Nation's Capital, where the Biological Survey has maps on display that show how numerous are the areas not included on this trip. Officials of the Survey will be glad to tell of the great development programs that are being carried out on these refuges.

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IT CAN HAPPEN HERE

(*Continued from page* 283)

Reserve Board, or handing over the duties of an independent regulatory commission to somebody else, in those four cases Congress would have a look in. For all the rest it might as well, if this bill should pass, be exiled to Timbuctoo.

And there is no time limit. The proposed bill would hand over to the President the absolute power, without limit in time, to do substantially anything he happened to feel like doing to the whole Government organization of the United States. He could create new Departments—outside the Civil Service, alter the Government at Washington till even Uncle Sam wouldn't know his way around, and make Congress like it; and nobody could check him up.

No President ever had such power. No President, to my knowledge, ever asked for such power before. So far as the executive departments are concerned, this bill would, I repeat, abolish the Congress of the United States.

I have not read all the bills that have ever been introduced in Congress, but I have read a great many of them. To the best of my knowledge and belief, nothing like this has ever been seen on Capitol Hill before.

The present attack on Conservation, then, is not only the most formidable and dangerous ever directed against that great national policy, but it is bound up with a concentration of power in the hands of a single man. I warn the American people that if this bill goes through, then we shall know, to our sorrow, that It *Can* Happen Here.

CONTROLLING MAD WATERS

(*Continued from page* 300)

(a) In the Ohio, Missouri, and Upper Mississippi drainages, surrounded by choice farm lands, are nearly fifty million acres of ill-cared-for forests situated upon heavy and deep soils and underlain by great depths of limestone and other sedimentary materials, which are fundamentally "unsaturable," except at their thin margins adjacent to stream channels. In their higher portions, most distant from stream banks, months or years are required for water which enters the soil to reach the level at which springs appear. Given, then, protection of the forest from fire and grazing so that absorption at the surface can and does occur,—which is the first "condition" in every case,—these forest lands have a storage capacity which will never be taxed.

Here, then, are millions of acre-feet of storage, for potential flood water, whose cost to the public is, at present, not more than the cost of fire protection. The forests, and their owners who are willing to maintain them as true protection forests, deserve to be dealt with as substantial contributors to flood protection. Assuming that for the entire area here included nine-inch rains may be possible, and that in good condition forest areas may absorb and store six inches more water than do farm lands, in each such rain as may occur, there is involved a total "premium" storage capacity of some 25,000,000 acre-feet. It is wholly impossible to say what portion of this potential storage is available in the present condition of these forest lands.

Areas of this type may partially fail in absorption during periods of ground-freezing or ice-coating, but even then there are commonly many avenues for water penetration, as where leaves collect in deep masses, so that actual runoff to streams is relatively insignificant, perhaps ten per cent of that which occurs from fields under like circumstances. If this means that the same degree of storage cannot always be guaranteed, remember also that a reservoir may be half full when its entire capacity is most needed.

(b) Within the Ohio drainage there are some mountainous slopes in the rather limited area of metamorphic or igneous rocks, where the soil is relatively loose, and absorption under forest is all the more certain, yet where the soil mantle is not deep, and the underlying rock (sometimes clay) masses are not permeable. After prolonged rains, such mountain slopes, termed "saturable watersheds," may transport water upon the rock surfaces and feed it into stream channels almost as rapidly as the water is absorbed. While flood water is here delayed when a "wet spell" begins, yet there can be no guarantee that the outflow of groundwater will not enter into prolonged floods, and it therefore follows that "protection forests" are here of much less worth than in the first case. It will be very high at times, and least when the greatest floods are building up. Very significant facts have been determined in the Rockies for this type of watershed.

(c) In addition to the above, both the Ohio and Upper Mississippi valleys contain large areas of poorly drained land which are, essentially, in a saturated condition most of the time, certainly through most winter periods. Here the presence of forests often has little or no effect. Water will be absorbed if there is space for it, and beyond that will escape laterally as the low gradient may permit. Forests may help to drain such lands between rains, and may be preferable to uncontrolled ditching by offering an impediment to runoff when the soil is flooded. In the opinion of the writer it is the great extent of these bottomlands and semi-swamps in wide, poorly drained valleys, which creates in the Ohio Valley a constant flood menace,—in addition, of course, to the large extent of clayey farm lands.

In the Upper Mississippi Valley "saturated" areas are largely depressions of glacial origin, some swamps without outlets, others draining into lakes and only by circuitous routes into the main stream channels. It is only after unusual snow accumulations have melted that these uncontrolled natural reservoirs "overflow" at a serious rate.

In planning flood control it behooves the nation to make use of protection forests where their value is most positive, which is in regions of considerable relief, with

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heavy soils of great depth or those which overlie formations of sedimentary origin in some degree water-bearing. This can be done on a large scale in the Mississippi Valley without disturbing the economy of agriculture. In all cases forests have some value in protecting soil surfaces, but in many cases the storage capacity for excessive amounts of rainfall does not exist. It is believed these latter cases explain the contention of engineers that in great floods the forests have no effect, but they do not justify any such absolute statement.

HOW I FOUND THE RANGER TRAIL

(*Continued from page* 297)

his wife and I were left alone on the ranch. O'Connor and I went out on the open range and picked up cow chips for our winter's fuel. Twenty big two-horse wagon loads of dried cow chips we hauled in and stacked near the "soddy."

Then the winter winds and snows roared down from the Dakotas and the mercury dropped below zero but in the soddy we were warm and comfortable. The thick walls kept out the heat in summer and the cold in winter. Day by day we fed out the hay we had stacked so laboriously to some four hundred head of cattle. O'Connor fed those at the ranch and did the chores while I rode six miles each morning to Goose Lake, caught up the team, harnessed them to a big sled, loaded it with hay and fed the rest of the cattle. The days were short and it was nearly always dark when I got back to the soddy. So the winter passed and when I went on to Denver in the spring I was a tenderfoot no longer.

There is an odd parallel between my wanderings over the West and my father's early roaming in the East. He was twenty-one when he left Denmark for America. I was the same age when I got off the train at Hyannis. He, too, went hungry many times before he found himself. When he learned of my dishwashing experience he wrote me and told of how sadly he turned away from a restaurant where they had gruffly refused his offer to wash dishes for a square meal.

"Dishwashing will do in a pinch but one can learn all there is to it in a day or two," he said.

Before he found himself as a newspaper reporter he turned his hand gladly to any honest work that would yield a living. Working in the coal mines of Pennsylvania, selling flatirons, patent ironing boards, books or what came next.

He lived to glorify the reporter's job as no other newspaper man ever has and to win the acclaim of the world for the relentless battle he waged with his pen for the poor in New York's teeming slums. His strong sense of justice and his sympathy for the unfortunate gave power to his pen and when Theodore Roosevelt came into Mulberry Street as police commissioner, he walked across to father's dingy office and said, "I have come to help."

There began then a friendship that lasted to my father's death. Two strong men with equal admiration for courage, the same contempt for sham, the same high ideals of citizenship and manhood and the same sense of justice and fair play.

So together they fought for the things they believed in. Roosevelt went on to become governor of New York, assistant secretary of the Navy, vice president and president. Father waged his battle for the poor, for the destruction of disease-breeding tenements, for parks and playgrounds. No man ever fought so hard or so successfully for his fellow man. He blazed the path for the social worker of today but was a straight path that hewed to the root of the evil he saw and I doubt very much whether he would have patience with some of the theories and practices of social work today.

Father never used his friendship with the President to advance his own or anyone else's interest though it was natural that he should have been appealed to to use his "influence" time and again.

"Influence?" he would snort—he hated the word. "I have no influence. You do not know the President. If I am sure that a man has not had a fair trial then I will ask the President to intercede and try the case on its merits but that is all."

It takes ten years to bring about any kind of a reform, my father used to say. The fight for the country's trees was older than that when I turned from the range to the timber trails. The first real progress along the lines of conservation began with the coming of Theodore Roosevelt and Gifford Pinchot. Both were conservationists. Pinchot had the technical training and Roosevelt had the power. The two struck hands and the battle for the trees was half won. The dream of the conservationists was on its way to realization.

Right and left lands were withdrawn from the Public Domain and set aside as Forest Reserves. Howls of protest rose from the big lumber interests and the cattle kings entrenched in selfishness. No longer could the lumberman hire a lumber jack to stake out a rich timber claim as a homestead and pay him $50 for the final patent. The public lands, said Roosevelt and Pinchot, belonged to the people and should be held in trust for them.

The same drama was taking place on the open range. The best of it had been gobbled up by the cattle kings and what was left was overcrowded and overgrazed. The little man had no chance. Often he sold his few cows and went to work for the big livestock company before they drove him out of business.

These were the conditions when Roosevelt and Pinchot took hold. Stockmen and lumbermen fought them to the last ditch. They had much to say of the trails and bridges they had built, the hardships they endured in the settlement of the West, of their inalienable right to the range. But Roosevelt had put his hand to the plow and he was not the kind to turn back. The country's resources belonged to all, not to a few. The National Forests stand today as evidence of who won that battle.

The curtain was rising on this new era in the history of the Public Domain when I came to Park City sitting high in a can-

yon of the Wasatch Mountains where winter still lingered though it was early spring. Pine clad hills hovered over the cluster of drab buildings squatting in the gulch. Snow still clung to the slopes and here and there the mine dumps made unsightly blotches of rusty color against the white, telling of huge gopher holes where men gouged deep into the bowels of the earth. Back and forth high over the roof tops, like pot-bellied spiders clinging to webs of steel, great rusty ore buckets creaked along slender cables on their way from mine to mill.

Fourteen husky young men from the range, the lumber camps and the mines clustered about the great barrel-shaped stove that blushed a dull red in the lobby of the hotel while the wind whistled under the crack of the door. There wasn't even a vague notion in the lot of us as to the ordeal that lay ahead. We were here for the ranger examination and that in itself was an adventure.

For two days the examiners put us to the test. We rode to demonstrate our horsemanship and shot at a post while on the gallop to show our marksmanship. We packed a horse and threw the diamond hitch, did some simple surveying, cut down trees, trying to fall them on a stake set by the examiner, mapped and estimated timberland, made out bills of lumber, camp supplies and many other things.

When it was over I went back to Coyote, to wait the results of the examination. As I rode over the hills on "3-K," the big bay horse that had belonged to Old Charley Adams, I often thought of my first introduction to the Utah country and to Charley and his beautiful horse.

I had come down from Denver and got off the train at Thompson's just as the Coyote outfit was unloading eight hundred head of cattle that "J. M." and his partner, Mr. Carpenter, had purchased in Nevada, shipped to Thompson's and which were now to be driven to Coyote. Mr. Carpenter gave me a job and that night I slept in the camp down by the railroad tracks. Early next morning we started on the trail to Coyote.

Trailing down the Grand River next day on the dugroad that overlooked the muddy stream Old Charley Adams had trouble with "3-K." The constant switching of the big bay's long tail irritated the old man into an incessant stream of profanity.

Weighing a good two hundred pounds without his leather chaps and the heavy saddle and bridle, both studded with silver ornaments, the old man was a load for any horse. Charley tried fastening the horse's tail between its hind legs with a stout cord tied to the saddle girth but this failed and he cursed more heartily.

Two days later the herd wound wearily into the outskirts of Moab and camped for the night. Old Hile Savage served a hot supper under the cottonwoods by the river bank. As I walked to the glowing campfire, Charley Adams was busy heating a branding iron in the coals. When the iron was white hot, with the aid of one of the riders, he threw "3-K" down on his side, seized the hot iron and drew it completely around the horse's tail about eight or ten inches from the base. It seared to the bone. The smoke and smell of burning hide and hair rose on the air.

With a snap of his wrist he broke off the tail and rising turned the horse loose, with an oath. The thing was done so quickly I did not know what was under way until "3-K" staggered to his feet and Adams stood there with the long brown tail in one hand, the smoking iron in the other. The cruelty and spitefulness of the thing stunned me.

"For pure damn meanness you ought to be shot!" I burst out. The old man whirled on me with the hot iron in his hand.

"Why! What in hell have you got to do with it, you condemned little tenderfoot, hey?" he roared.

I was about to answer when Mr. Carpenter drew me away under the trees.

"I know how you feel but the horse was Charley's personal property. If it belonged to the ranch he could never have done it. We do not allow our horses to be abused. The first thing you will have to learn here is not to interfere between a man and his horse."

No one knew where Charley Adams had come from. From stray remarks he had let out now and then we gathered that he had once been smuggling over the Mexican border. It is probable that Adams was not his real name.

When he failed to come in one winter from Dry Point where he was herding cattle alone, they found him dead in his cabin. Every effort to locate a relative failed. There was a driving snow and the ground was almost as hard as the steel pick when we dug his grave at the edge of the pines beyond the wheat field. Mr. Carpenter read a brief burial service over him as we stood shivering in the wind. Then the hard clots of earth rattled on the casket and we trudged back to the warm bunkhouse. The man with a past had buried it with him.

That spring I saw lovable old "J. M." lose his temper for the first time. We were just sitting down to dinner in the "big house," about eighteen or twenty ranch hands and riders with "J. M." in his accustomed place at the head of the table. Mrs. Miller, the housekeeper, came in to announce that a deputy sheriff on the way to Moab with a prisoner was outside. No traveler ever passed the doors of Coyote at meal times.

"Make a place for them and tell them to come in," said "J. M."

The deputy came in. Walking at his side was a mere lad, white faced and scared. He was shackled to his burly guardian with chains that clanked as he walked. Looking down we saw that he had on leg irons such as are worn by some convicts in the southern road camps.

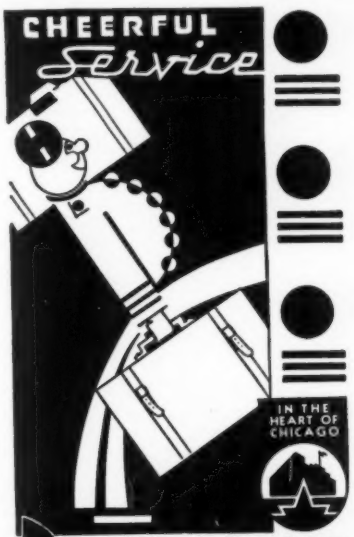
"J. M.'s" face turned livid with anger. He rose in his chair and snapped:

"Take the shackles off that boy! Take them off, quick, before I take him down to the shop and cut them off myself. How dare you come in my house like that?"

The deputy unlocked the chains and sat down to an uncomfortable dinner. No one spoke to him. When he drove away he was apparently ashamed to put the irons on the boy again.

So the days passed and then one day the mail rider scattered the contents of his mail bag over the kitchen table. Mrs. Miller spelled out the addresses on the envelopes slowly.

"Jesus Martinez. Huh! Them sheep herders got a lot of mail. Jose ————" But I did not hear her. On the top of the pile was a telegram for me. I tore it open. I was ordered to report to Supervisor Snow, at Moab, for duty as forest ranger on the Blue Mountain or Monticello division of the La Sal Forest Reserve. I had found the ranger trail at last.



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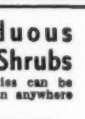
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WHO'S WHO

Among the Authors in this Issue

CHARLES F. BROOKS and HENRY I. BALDWIN (*How Forests Retard Floods*) are both noted for their scientific achievement. Dr. Brooks is a meteorologist, geographer and well-known writer. Born in St. Paul, graduated from the University of Illinois, he took his master's degree from Harvard in 1914. He has since distinguished himself in his own field and has been, since 1931, Director of Harvard's Blue Hill Observatory at Milton, Massachusetts. Henry Ives Baldwin, his collaborator, is a Yale man, class of '19. Graduated from the Yale Forest School in 1922, he took his doctor's degree in 1931. Born at Saranac Lake, in New York, a cofounder of the Adirondack Mountain Club in 1921, he spent over two years studying forest conditions in Europe. Dr. Baldwin's forestry work here has covered a number of states, and he is now engaged in forest research for the New Hampshire Forestry Department.

Charles F. Brooks

GIFFORD PINCHOT (*It Can Happen Here*) needs no introduction. From the days of President Theodore Roosevelt, whose good friend he was and who made him the first Chief Forester of the United States, he has fought the good fight. Always a progressive and a leader in his profession, Gifford Pinchot has tenaciously guarded and tirelessly worked to make secure the best interests of forestry in America. Here he ties together in importance the maladministration of the natural resources threatened by proposed reorganization provisions in the Brownlow Report, and the issue of the Supreme Court. He considers the Report "the most dangerous attack made upon the national conservation policy since it was first laid before the people of the United States by Theodore Roosevelt in 1908." Forthright expression, and typical of America's ace-forester.

Gifford Pinchot

DAREL MCCONKEY (*Sassafras Voyage*) is Field Supervisor of the Federal Writers Project, engaged in preparing the American Guide Series. Devoted to historical research, and well known as a travel writer, Mr. McConkey here reveals a fascinating page in early American history.

FRANK J. HALLAUER (*Charcoal for Camp Cooking*) graduated from Purdue in 1919, has had charge of the requirement phase of the Forest Survey since 1931. With a fine background devoted to research in utilization, and nine years in actual woods operations, he has written much on how to promote the use of lumber and secure wider markets for wood products.

CARLOS G. BATES (*Controlling Mad Waters*), a University of Nebraska man, is a principal silviculturist on the staff of the Lake States Forest Experiment Station, where he has been since 1928. During all of his thirty years in the Forest Service, Mr. Bates has been gathering facts about forest influences. When he began probing, therefore, around what we commonly term the "headwaters of the Mississippi" it was with a formidable background of experience in careful observation and measurements. In this article, he expresses his convictions on the broad problem of Mississippi floods and forest values in relation thereto.

Carlos G. Bates

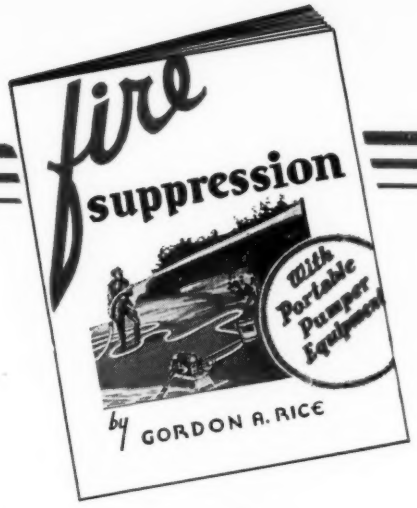
HOWARD ZAHNISER (*Sanctuary*) is of the Public Relations staff of the United States Biological Survey, in charge of current and visual information via press, radio, exhibits and photography. In *Sanctuary* he takes you on an "armchair tour" of the newly established chain of major wildlife refuges—an interesting and gainful journey, minus the fatigue of travel. Mr. Zahniser is a graduate of Greenville College, in Illinois, and has been with the Biological Survey since 1931.

Howard Zahniser

JOHN RIIS (*How I Found the Ranger Trail*), newspaper man of Richmond, Virginia, is the son of Jacob August Riis, world-renowned pioneer social reformer and author. Mr. Riis tells of early days on the western ranges, giving his own vivid impressions of men and places, colored by a philosophy that makes good reading—his own and his father's—of how a man found himself in the days when conservation was just dawning in America.

John Riis

THE COVER—"Blue Winged Teal in Flight"—is one of Lorene Squire's outstanding photographic studies of wildlife.



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